```
=> FILE REG
FILE 'REGISTRY' ENTERED AT 15:49:29 ON 14 JUL 2006
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2006 American Chemical Society (ACS)

Property values tagged with IC are from the ZIC/VINITI data file
provided by InfoChem.

STRUCTURE FILE UPDATES:    13 JUL 2006   HIGHEST RN 892505-73-6
DICTIONARY FILE UPDATES:   13 JUL 2006   HIGHEST RN 892505-73-6

New CAS Information Use Policies, enter HELP USAGETERMS for details.

TSCA INFORMATION NOW CURRENT THROUGH January 6, 2006

  Please note that search-term pricing does apply when
  conducting SmartSELECT searches.

REGISTRY includes numerically searchable data for experimental and
predicted properties as well as tags indicating availability of
experimental property data in the original document.  For information
on property searching in REGISTRY, refer to:

http://www.cas.org/ONLINE/UG/regprops.html

=> FILE HCAPL
FILE 'HCAPLUS' ENTERED AT 15:49:32 ON 14 JUL 2006
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
COPYRIGHT (C) 2006 AMERICAN CHEMICAL SOCIETY (ACS)


Copyright of the articles to which records in this database refer is
held by the publishers listed in the PUBLISHER (PB) field (available
for records published or updated in Chemical Abstracts after December
26, 1996), unless otherwise indicated in the original publications.
The CA Lexicon is the copyrighted intellectual property of the
the American Chemical Society and is provided to assist you in searching
databases on STN.  Any dissemination, distribution, copying, or storing
of this information, without the prior written consent of CAS, is
strictly prohibited.

FILE COVERS 1907 - 14 Jul 2006  VOL 145 ISS 4
FILE LAST UPDATED: 13 Jul 2006  (20060713/ED)

New CAS Information Use Policies, enter HELP USAGETERMS for details.

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

=> D QUE
L1        2761813 SEA FILE=REGISTRY ABB=ON  ((AL OE AS OR B OR BE OR CA OR CD OR
                  CS OR CU OR EU OR FE OR GA OR GD OR GE OR HF OR HG OR IN OR K
                  OR LA OR LI OR MG OR MN OR NA OR ND OR NI OR PB OR PR OR RB OR
                  SB OR SC OR SE OR SI OR SM OR SN OR SR OR TH OR TI OR TL OR W
                  OR Y OR YB OR ZN OR ZR)(L)H)/ELS
L2         106013 SEA FILE=REGISTRY ABB=ON  L1 NOT C/ELS
L3          26491 SEA FILE=REGISTRY ABB=ON  L2 NOT O/ELS
L12             1 SEA FILE=REGISTRY ABB=ON  HYDROGEN/CN
```

Claims 32

4 1

```
L13       106752 SEA FILE=HCAPLUS ABB=ON  L3
L14       313716 SEA FILE=HCAPLUS ABB=ON  L12
L15        35806 SEA FILE=HCAPLUS ABB=ON  L14(L)PREP/RL
L16        12088 SEA FILE=HCAPLUS ABB=ON  L13 AND L14
L17        25335 SEA FILE=HCAPLUS ABB=ON  (L14 OR H2 OR HYDROGEN)(4A)(STOR? OR
                GENERAT?)
L18          971 SEA FILE=HCAPLUS ABB=ON  L16 AND L17
L19      1538847 SEA FILE=REGISTRY ABB=ON  L1 AND N/ELS
L20         7025 SEA FILE=REGISTRY ABB=ON  L3 AND L19
L21        14463 SEA FILE=HCAPLUS ABB=ON  L20
L22          101 SEA FILE=HCAPLUS ABB=ON  L21 AND L18
L23          477 SEA FILE=REGISTRY ABB=ON  L20 AND 2/M
L24          445 SEA FILE=REGISTRY ABB=ON  L23 NOT P/ELS
L25          225 SEA FILE=REGISTRY ABB=ON  L24 NOT (CL OR I OR BR OR F)/ELS
L26          109 SEA FILE=REGISTRY ABB=ON  L25 NOT 1-10/NR
L27          163 SEA FILE=HCAPLUS ABB=ON  L26
L28           46 SEA FILE=HCAPLUS ABB=ON  L27(L)PREP/RL
L36          297 SEA FILE=REGISTRY ABB=ON  L20 AND B/ELS AND 1/M
L39          418 SEA FILE=HCAPLUS ABB=ON  L36
L40          113 SEA FILE=HCAPLUS ABB=ON  L39(L)PREP/RL
L41            2 SEA FILE=HCAPLUS ABB=ON  L22 AND L40
L42            6 SEA FILE=HCAPLUS ABB=ON  L28 AND L22
L43            8 SEA FILE=HCAPLUS ABB=ON  L41 OR L42
L44           27 SEA FILE=HCAPLUS ABB=ON  (L27 OR L39) AND  L18
L45           24 SEA FILE=HCAPLUS ABB=ON  L44 AND (?AMIDE? OR ?NITRIDE?)
L47          217 SEA FILE=HCAPLUS ABB=ON  L25
L48           19 SEA FILE=HCAPLUS ABB=ON  L18 AND  L47
L50           26 SEA FILE=HCAPLUS ABB=ON  (L41 OR L42 OR L43) OR L45 OR L48
L52        24739 SEA FILE=REGISTRY ABB=ON  ((LI OR CA OR NA OR MG OR K OR      claim 1
                BE)(L)(B OR AL OR GA OR IN OR TL)(L)H)/ELS
L53       135361 SEA FILE=HCAPLUS ABB=ON  L52
L54          190 SEA FILE=HCAPLUS ABB=ON  L53 AND L15 AND L17
L56            8 SEA FILE=HCAPLUS ABB=ON  L54 AND (?AMIDE? OR ?NITRIDE?)
L58           33 SEA FILE=HCAPLUS ABB=ON  L50 OR L56
```

=> D L58 BIB ABS IND HITSTR 1-33

L58 ANSWER 1 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2006:446131 HCAPLUS

DN 144:471531

TI Scaffolded borazane-metal hydride **hydrogen storage** materials

IN Torgersen, Alexandra N.; Jorgensen, Scott W.

PA USA

SO U.S. Pat. Appl. Publ., 29 pp.
CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	---------------	----	--------	--------------------	--------
PI	US 2006097221	A1	20060511	US 2005-262297	20051028
	WO 2006052473	A2	20060518	WO 2005-US38901	20051028

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,
GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX,
MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE,
SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,

VN, YU, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRAI US 2004-625687P P 20041105

AB A **hydrogen storage** composite consisting of a mesoporous scaffolding material and a **hydrogen storage** composition is produced. The **hydrogen storage** composition is prepared by ball milling borazane and a metal hydride, especially LiH or LiAlH4.
The mesoporous scaffolding material having a median pore size of 2-4 nm and a surface area > 500 m2/g can be a zeolite, an alumina-based, or carbon-based porous material. The composite if formed by dissolving the **hydrogen storage** composition in a cyclic ether solution and applying the mixture to a scaffolding material.

INCL 252184000

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST scaffolded borazane metal hydride **hydrogen storage** material

IT Porous materials
(mesoporous; scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT Ball milling
(scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT Zeolites (synthetic), uses
RL: NUU (Other use, unclassified); USES (Uses)
(scaffolding material; scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT **886848-87-9P 886848-89-1P**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)
(scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT **7580-67-8**, Lithium hydride **13774-81-7**, Borazane **16853-85-3**, Lithium aluminum hydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(scaffolded borazane-lithium hydride **hydrogen storage** materials)

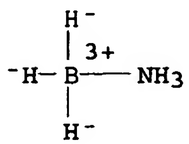
IT 1344-28-1, Alumina, uses 7440-44-0, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(scaffolding material; scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT **1333-74-0, Hydrogen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage** and release; scaffolded borazane-lithium hydride **hydrogen storage** materials)

IT **886848-87-9P 886848-89-1P**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)
(scaffolded borazane-lithium hydride **hydrogen storage** materials)

RN 886848-87-9 HCAPLUS

CN INDEX NAME NOT YET ASSIGNED

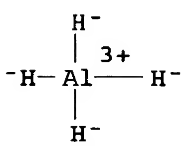


●x LiH

RN 886848-89-1 HCAPLUS
CN INDEX NAME NOT YET ASSIGNED

CM 1

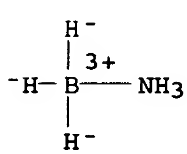
CRN 16853-85-3
CMF Al H4 . Li
CCI CCS



● Li^+

CM 2

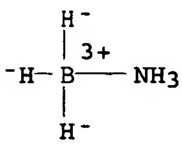
CRN 13774-81-7
CMF B H6 N
CCI CCS



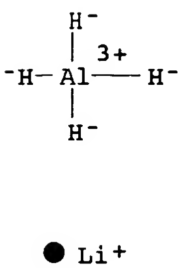
IT **7580-67-8**, Lithium hydride **13774-81-7**, Borazane
16853-85-3, Lithium aluminum hydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(scaffolded borazane-lithium hydride **hydrogen storage** materials)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 13774-81-7 HCAPLUS
CN Boron, amminetrihydro-, (T-4)- (9CI) (CA INDEX NAME)



RN 16853-85-3 HCAPLUS
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



IT **1333-74-0**, **Hydrogen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage** and release; scaffolded borazane-lithium hydride **hydrogen storage** materials)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

L58 ANSWER 2 OF 33 HCAPLUS
AN 2006:321654 HCAPLUS
DN 145:30847
TI Identification of Destabilized Metal Hydrides for **Hydrogen Storage** Using First Principles Calculations
AU Alapati, Sudhakar V.; Johnson, J. Karl; Sholl, David S.
CS Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, USA
SO Journal of Physical Chemistry B (2006), 110(17), 8769-8776
CODEN: JPCBFK; ISSN: 1520-6106
PB American Chemical Society
DT Journal
LA English
AB Hydrides of elements of periods 2 and 3 are candidates for H storage, but they typically have heats of reaction that are too high to be of use in fuel cell-powered vehicles. Exptl. work has focused on destabilizing

metal hydrides through alloying with other elements and a large number of possible destabilized metal hydride reaction schemes exist. However, in many cases, the thermodn. data required to assess the enthalpies of these reactions are not available. The authors used 1st principles d. functional theory calcns. to predict the reaction enthalpies for >100 destabilization reactions that have not previously been reported. Many of these reactions are predicted to be not useful for reversible H storage, having calculated reaction enthalpies that are either too high or too low. More importantly, the calcns. identify five promising reaction schemes that merit exptl. study: 3LiNH2 + 2LiH + Si → Li5N3Si + 4H2, 4LiBH4 + MgH2 → 4LiH + MgB4 + 7H2, 7LiBH4 + MgH2 → 7LiH + MgB7 + 11.5H2, CaH2 + 6LiBH4 → CaB6 + 6LiH + 10H2, and LiNH2 + MgH2 → LiMgN + 2H2.

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 65, 69, 75, 78

ST **hydrogen storage** destabilized metal hydride density functional theory

IT Density functional theory
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT Hydrides
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT 59977-60-5, Magnesium boride (MgB7)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT **7580-67-8**, Lithium hydride (LiH)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); FORM (Formation, nonpreparative); RACT (Reactant or reagent); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT 12007-74-8, Magnesium boride (MgB4) 12007-99-7, Calcium boride (CaB6) 66905-66-6, Lithium magnesium **nitride** (LiMgN) **67181-65-1**
RL: FMU (Formation, unclassified); PRP (Properties); TEM (Technical or engineered material use); FORM (Formation, nonpreparative); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT 7440-21-3, Silicon, uses **7693-27-8**, Magnesium hydride (MgH2) **7782-89-0**, Lithium **amide** (Li(NH2)) **7789-78-8**, Calcium hydride (CaH2) **16949-15-8**, Lithium borohydride (LiBH4)
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7439-95-4, Magnesium, uses 7440-42-8, Boron, uses 7440-70-2, Calcium, uses 7784-21-6, Aluminum hydride (AlH3) 11073-06-6, Calcium lithium silicide (CaLiSi2) 12007-25-9, Magnesium boride (MgB2) 12008-29-6, Silicon boride (SiB6) 12013-43-3 12013-55-7, Calcium silicide (CaSi) 12041-50-8, Aluminum boride (AlB2) 12042-37-4, AlLi 12042-65-8 12049-66-0, Calcium **nitride** (Ca2N) 12057-71-5, Magnesium **nitride** (Mg3N2) 12133-32-3 **12163-25-6**, Magnesium **nitride** silicide (MgN2Si) 12253-44-0 12254-22-7 12359-85-2 **12408-97-8** 12431-74-2, Calcium magnesium silicide (CaMgSi) 12590-19-1, Calcium lithium silicide (Ca2LiSi3) 12775-68-7, Calcium silicide (Ca5Si3) 19597-69-4, Lithium azide (Li(N3)) 22831-39-6,

Magnesium silicide (Mg2Si) 24304-00-5, Aluminum **nitride** (AlN)
26134-62-3, Lithium **nitride** (Li3N) 51846-18-5 61027-73-4,
Aluminum lithium **nitride** (AlLi3N2) 61504-85-6, Aluminum
lithium silicide (AlLiSi) 66057-98-5, Aluminum calcium silicide
(Al2Ca3Si2) **121768-76-1**, Magnesium boride **nitride**
(Mg3BN3) 144972-78-1, Lithium magnesium silicide (Li12Mg3Si4)
889103-07-5, Aluminum calcium silicide (Al2CaSi) **889103-09-7**,
Aluminum calcium hydride (Al2CaH8) **889103-11-1** 889103-13-3,
Magnesium boride (MgB8)
RL: PRP (Properties); TEM (Technical or engineered material use); USES
(Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

IT **1333-74-0**, Hydrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

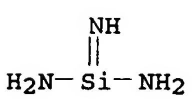
IT **7580-67-8**, Lithium hydride (LiH)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); TEM
(Technical or engineered material use); FORM (Formation, nonpreparative);
RACT (Reactant or reagent); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

IT **67181-65-1**
RL: FMU (Formation, unclassified); PRP (Properties); TEM (Technical or
engineered material use); FORM (Formation, nonpreparative); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

RN 67181-65-1 HCAPLUS
CN Silanediamine, 1-imino-, pentalithium salt (9CI) (CA INDEX NAME)



●5 Li

IT **7693-27-8**, Magnesium hydride (MgH2) **7782-89-0**, Lithium
amide (Li(NH2)) **7789-78-8**, Calcium hydride (CaH2)
16949-15-8, Lithium borohydride (LiBH4)
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered
material use); RACT (Reactant or reagent); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)

RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

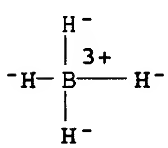
RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 7789-78-8 HCAPLUS
CN Calcium hydride (CaH2) (8CI, 9CI) (CA INDEX NAME)

CaH_2

RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li^+

IT **12163-25-6**, Magnesium **nitride** silicide (MgN2Si)
12408-97-8 **121768-76-1**, Magnesium boride **nitride**
(Mg3BN3) **889103-09-7**, Aluminum calcium hydride (Al2CaH8)
889103-11-1
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)
RN 12163-25-6 HCAPLUS
CN Silanediimine, magnesium salt (1:1) (9CI) (CA INDEX NAME)

$HN{=}Si{=}NH$

● Mg

RN 12408-97-8 HCAPLUS
CN Boranamine, 1-imino-, trilithium salt (9CI) (CA INDEX NAME)

$H_2N-B=NH$

●3 Li

RN 121768-76-1 HCAPLUS
CN Boranetriamine, magnesium salt (1:3) (9CI) (CA INDEX NAME)

$H_2N-B(NH_2)-NH_2$

●3 Mg

RN 889103-09-7 HCAPLUS
CN Aluminum calcium hydride (Al2CaH8) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
H	8	12385-13-6
Ca	1	7440-70-2
Al	2	7429-90-5

RN 889103-11-1 HCAPLUS
CN INDEX NAME NOT YET ASSIGNED

$H_2N-B(NH_2)-NH_2$

●3 Ca

IT **1333-74-0**, Hydrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(identification of destabilized metal hydrides for **hydrogen storage** using first principles calcns.)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 3 OF 33 HCAPLUS
AN 2006:277347 HCAPLUS

DN 144:491787
TI Improved Hydrogen Release from LiB0.33N0.67H2.67 with Noble Metal Additions
AU Pinkerton, Frederick E.; Meyer, Martin S.; Meisner, Gregory P.; Balogh, Michael P.
CS Materials and Processes Laboratory and Chemical and Environmental Sciences Laboratory, General Motors Research and Development Center, Warren, MI, 48090-9055, USA
SO Journal of Physical Chemistry B (2006), 110(15), 7967-7974
CODEN: JPCBFK; ISSN: 1520-6106
PB American Chemical Society
DT Journal
LA English
AB H release by the quaternary hydride, LiB0.33N0.67H2.67, was improved through the incorporation of small quantities of noble metals. Adding 5% Pd as Pd metal particles or as PdCl2 decreased T1/2, the temperature corresponding to the midpoint of the H release reaction, by ΔT1/2 = -43° and -76°, resp. PtCl2 and Pt nanoparticles supported on a Vulcan C substrate proved to be even more effective, with ΔT1/2 = -90°. The amount of NH3 released during dehydrogenation is decreased compared to that from additive-free material, and, more importantly, at temps. <210°, H is released with no detectable NH3. In contrast to additive-free LiB0.33N0.67H2.67, which melts completely >190° and releases H from the liquid state only .gtorsim.250°, H release from LiB0.33N0.67H2.67 + 5% Pt/Vulcan C is accompanied by partial melting and a cascade through solid intermediate phases. Calorimetry indicated that both additive-free and Pt-added LiB0.33N0.67H2.67 release H exothermically, and hence the reverse reaction is thermodynamically unfavorable. By exposing partially dehydrogenated samples to high H2 pressures at modest temps., fractional H uptake (roughly 15% of the released H) was achieved. The mechanism by which noble metals promote H release is unknown, but this behavior is consistent with that expected for a catalyst, including a large effect with small addns. and saturation of the effect at low concentration
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 56
ST **hydrogen storage** lithium boride hydride **nitride** noble metal additive
IT Carbon black, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(Vulcan C; improved hydrogen release from LiB0.33N0.67H2.67 with additives)
IT 7647-10-1, Palladium chloride (PdCl2) 7705-07-9, Titanium chloride (TiCl3), uses 7782-42-5, Graphite, uses 10025-65-7, Platinum chloride (PtCl2)
RL: MOA (Modifier or additive use); USES (Uses)
(improved hydrogen release from LiB0.33N0.67H2.67 with additives)
IT **1333-74-0**, Hydrogen, uses **874891-56-2**, Lithium boride hydride **nitride** (Li3BH8N2)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(improved hydrogen release from LiB0.33N0.67H2.67 with noble metal additives)
IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses
RL: MOA (Modifier or additive use); USES (Uses)
(improved hydrogen release from LiB0.33N0.67H2.67 with noble metal additives)
IT **1333-74-0**, Hydrogen, uses **874891-56-2**, Lithium boride hydride **nitride** (Li3BH8N2)

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(improved hydrogen release from LiB0.33N0.67H2.67 with noble metal additives)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 874891-56-2 HCAPLUS
CN Lithium boride hydride nitride (Li3BH8N2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	2	17778-88-0
H	8	12385-13-6
B	1	7440-42-8
Li	3	7439-93-2

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 4 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2006:231252 HCAPLUS
DN 144:257307
TI Preparation of **hydrogen storage** materials from lithium **amide**, lithium borohydride, and metal additives

applicant

IN Pinkerton, Frederick E.; Balogh, Michael P.; Meyer, Martin S.; Meisner, Gregory P.
PA USA
SO U.S. Pat. Appl. Publ., 9 pp., Cont.-in-part of U.S. Ser. No. 789,899.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2006057049	A1	20060316	US 2005-231543	20050921
	US 2005191236	A1	20050901	US 2004-789899	20040227
PRAI	US 2004-789899	A2	20040227		

AB A **hydrogen storage** composition for enhanced release of hydrogen is prepared by mixing LiNH2 and LiBH4 with a metal additive or a metal-containing additive to form particles consisting of Li50B17N33H133 with dispersed additive. The metal additive can be Fe, Ni, Pd, or Pt and the metal-containing additive can be iron (II) chloride, nickel (II) chloride, palladium (II) chloride, or platinum (II) chloride. Carbon can be used as a carrier for the metal particles.
INCL 423284000
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST **hydrogen storage** compn lithium **amide** borohydride metal additive
IT 7440-44-0, Carbon, uses
RL: NUU (Other use, unclassified); USES (Uses)
(carrier; preparation of **hydrogen storage** materials)
IT **1333-74-0P**, **Hydrogen**, preparation

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(preparation of **hydrogen storage** materials)

IT 7782-89-0, Lithium **amide 16949-15-8**, Lithium borohydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(preparation of **hydrogen storage** materials)

IT 7782-89-0DP, Lithium **amide**, compound with lithium borohydride **16949-15-8DP**, Lithium borohydride, compound with lithium **amide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation of **hydrogen storage** materials)

IT 7439-89-6, Iron, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7647-10-1, Palladium II chloride 7718-54-9, Nickel II chloride, uses 7758-94-3, Iron II chloride 10025-65-7, Platinum II chloride
RL: MOA (Modifier or additive use); USES (Uses)
(preparation of **hydrogen storage** materials)

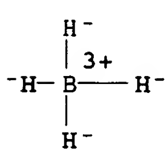
IT **1333-74-0P, Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(preparation of **hydrogen storage** materials)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

IT **16949-15-8**, Lithium borohydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(preparation of **hydrogen storage** materials)

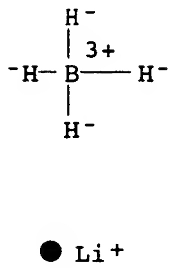
RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li^+

IT **16949-15-8DP**, Lithium borohydride, compound with lithium **amide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(preparation of **hydrogen storage** materials)

RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



L58 ANSWER 5 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2006:133444 HCAPLUS
DN 144:276906
TI Synthesis and **hydrogen storage** properties of Li-Mg-N-H system
AU Kubokawa, Toyoyuki; Tokoyoda, Kazuhiko; Okamoto, Keisuke; Matsuura, Shigeru; Ichikawa, Takayuki; Fujii, Hironobu
CS New Mater. Dev. Team, Res. Dev. Cent., Taiheiyo Cement Corporation, Japan
SO Taiheiyo Semento Kenkyu Hokoku (2005), 149, 57-65
CODEN: TKHOFN; ISSN: 1344-8773
PB Taiheiyo Semento K.K., Chuo Kenkyusho
DT Journal
LA Japanese
AB The Li-Mg-N-H system that is synthesized by the mech. milling of Mg(NH2)2 and LiH is a material as the promising hydrogen media, because it is expected that it has the hydrogen capacity of about 5.5 mass% in the operation temperature around 150-200°. In this paper, we exand. hydrogen absorption properties and cycling test for the mech. milled mixture of 3Mg(NH2)2 and 8LiH, where the hydrogen desorption and absorption are performed at 200° under vacuum and 10-MPa hydrogen, resp. As a result, it has been understood to be able to almost completely reabsorb the hydrogen in a condition of above absorption pressure, and to show an excellent reversibility after ten cycles. Moreover, even if the mixts. of MgH2 or Mg3N2 together with LiNH2 are used as raw materials, the same system as the Li-Mg-N-H hydrogen can be synthesized by heat-treatment for the mixts. at the temperature around 250-350° after a mech. milling.
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST **hydrogen storage** lithium hydride magnesium **amide**; magnesium **nitride** lithium **amide** **hydrogen storage**
IT **1333-74-0P, Hydrogen**, uses **7580-67-8P**, Lithium hydride **7693-27-8P**, Magnesium hydride **7782-89-0P**, Lithium **amide** **7803-54-5P**, Magnesium **amide** (Mg(NH2)2) 12057-71-5P, Magnesium **nitride** **12135-01-2P**, Lithium imide
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); **PREP (Preparation)**; PROC (Process); USES (Uses)
(synthesis and **hydrogen storage** properties of Li-Mg-N-H system)
IT **1333-74-0P, Hydrogen**, uses **7580-67-8P**, Lithium hydride **7693-27-8P**, Magnesium hydride **7782-89-0P**, Lithium **amide** **7803-54-5P**, Magnesium **amide** (Mg(NH2)2) **12135-01-2P**, Lithium imide

RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); **PREP (Preparation)**; PROC (Process); USES (Uses)
(synthesis and **hydrogen storage** properties of Li-Mg-N-H system)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

H_2N—Mg—NH_2

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

L58 ANSWER 6 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2006:119631 HCAPLUS
DN 144:194317
TI Pressurized hydrogen delivery system for electrochemical cells
IN Pinkerton, Frederick E.; Meisner, Gregory P.; Balogh, Michael P.; Meyer, Martin S.
PA USA
SO U.S. Pat. Appl. Publ., 13 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2006029529	A1	20060209	US 2004-910066	20040803
	WO 2006017449	A2	20060216	WO 2005-US27285	20050801

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRAI US 2004-910066 A 20040803

AB A hydrogen delivery system for a fuel cell is provided that uses hydrogen as a reactant. A fluid **storage** vessel contains a **hydrogen storage** material that reversibly releases and **stores hydrogen** gas. The released **hydrogen** gas exits the fluid **storage** vessel, is pressurized by a fluid pressurization device, and then stored in a ballast vessel. The hydrogen gas is delivered as a reactant to the fuel cell from the ballast vessel at a pressure greater than or equal to the operating pressure of the fuel cell. Variations of the above described hydrogen delivery systems are further disclosed, as well as methods of delivering hydrogen to a fuel cell.

INCL 422242000; 429019000

CC 47-7 (Apparatus and Plant Equipment)
Section cross-reference(s): 52

ST pressurized hydrogen delivery system electrochem cell

IT Delivery apparatus
Electrochemical cells
Fuel cells
(pressurized hydrogen delivery system for electrochem. cells)

IT 7439-95-4, Magnesium, uses **7782-89-0**, Lithium **amide** 12196-72-4, Lanthanum pentanickel 12683-37-3 **16853-85-3**, Lithium alanate **874891-56-2**, Lithium boride hydride **nitride** (Li3BH8N2)
RL: DEV (Device component use); USES (Uses)
(pressurized hydrogen delivery system for electrochem. cells)

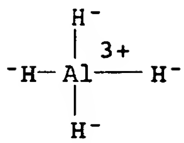
IT **1333-74-0**, Hydrogen, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(pressurized hydrogen delivery system for electrochem. cells)

IT **7782-89-0**, Lithium **amide** **16853-85-3**, Lithium alanate **874891-56-2**, Lithium boride hydride **nitride** (Li3BH8N2)
RL: DEV (Device component use); USES (Uses)
(pressurized hydrogen delivery system for electrochem. cells)

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 16853-85-3 HCAPLUS
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li^{+}

RN 874891-56-2 HCAPLUS
CN Lithium boride hydride nitride (Li3BH8N2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	2	17778-88-0
H	8	12385-13-6
B	1	7440-42-8
Li	3	7439-93-2

IT **1333-74-0**, Hydrogen, uses
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)
(pressurized hydrogen delivery system for electrochem. cells)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

L58 ANSWER 7 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2006:32624 HCAPLUS
DN 144:91228
TI **Hydrogen storage** method, **hydrogen-storing** material, and fuel cell system
IN Towata, Shinichi; Noritake, Tatsuo; Aoki, Masakazu; Kojima, Yoshitsugu; Miwa, Kazutoshi; Oba, Nobuko; Orishige, Shinichi; Nakamori, Hiroko; Kitahara, Manabu
PA Toyota Central Research and Development Laboratories Inc., Japan; Tohoku University
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2006008446	A2	20060112	JP 2004-187342	20040625
PRAI	JP 2004-187342		20040625		

AB The method is carried out by preparing a raw material mixture by mixing ≥2 compds. selected from **nitrides** and complex hydrides; and storing H by generating a hydride by reacting the raw material mixture with H. The H-storing material contains the generated hydride. The fuel

cell system has the above H-absorbing material.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell **hydrogen storage** method material
IT Fuel cells
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
IT **1333-74-0, Hydrogen**, uses
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
IT **7580-67-8P**, Lithium hydride **7803-54-5P**, Magnesium **diamide 13470-41-2P**, Zinc **amide**
16949-15-8P, Lithium tetrahydroborate **23321-74-6P**, Calcium **amide**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
IT 1313-49-1, Zinc **nitride** (Zn3N2) 12013-82-0, Calcium **nitride** (Ca3N2) 12057-71-5, Magnesium **nitride** (Mg3N2)
12408-97-8, Boron lithium **nitride** (BLi3N2) 26134-62-3, Lithium **nitride** (Li3N)
RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
IT **1333-74-0, Hydrogen**, uses
RL: DEV (Device component use); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8P**, Lithium hydride **7803-54-5P**, Magnesium **diamide 13470-41-2P**, Zinc **amide**
16949-15-8P, Lithium tetrahydroborate **23321-74-6P**, Calcium **amide**
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

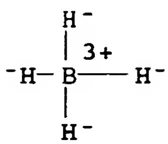
RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2N-Mg-NH_2$

RN 13470-41-2 HCAPLUS
CN Zinc amide (Zn(NH2)2) (9CI) (CA INDEX NAME)

$H_2N—Zn—NH_2$

RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li^+

RN 23321-74-6 HCAPLUS
CN Calcium amide (Ca(NH2)2) (9CI) (CA INDEX NAME)

$H_2N—Ca—NH_2$

IT **12408-97-8**, Boron lithium **nitride** (BLi3N2)
RL: RCT (Reactant); RACT (Reactant or reagent)
(**hydrogen storage** methods and **hydrogen-storing** materials for fuel cell systems)
RN 12408-97-8 HCAPLUS
CN Boranamine, 1-imino-, trilithium salt (9CI) (CA INDEX NAME)

$H_2N—B{=}NH$

●3 Li

L58 ANSWER 8 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1338753 HCAPLUS
DN 144:314874
TI Combustion of novel chemical mixtures for **hydrogen generation**
AU Shafirovich, Evgeny; Diakov, Victor; Varma, Arvind
CS School of Chemical Engineering, Purdue University, West Lafayette, IN, 47907, USA
SO Combustion and Flame (2006), 144(1/2), 415-418
CODEN: CBFMAO; ISSN: 0010-2180
PB Elsevier
DT Journal
LA English
AB The combustion-based **generation** of **hydrogen** using

sodium borohydride/aluminum/water mixts. was investigated. Water acted as an oxidizer for both aluminum and metal borohydride, and also as a source of hydrogen. Sodium borohydride was an addnl. hydrogen source, while aluminum increased combustion temperature, eliminating the need for catalyst. The proposed sodium borohydride/aluminum/water mixts. were combustible and exhibited high hydrogen yield. Mixts. with 50-70 wt% of Al were promising to obtain high H2 yield and stable self-sustained combustion.

CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST combustion **hydrogen generation** sodium borohydride aluminum water

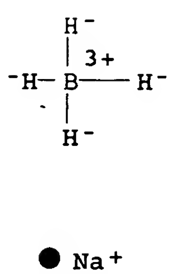
IT Fuel cells
(combustion of novel chemical mixts. for **hydrogen generation**)

IT 1310-73-2, Sodium hydroxide, processes 7429-90-5, Aluminum, processes 7732-18-5, Water, processes 9003-05-8, **Polyacrylamide**
16940-66-2, Sodium borohydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(combustion of novel chemical mixts. for **hydrogen generation**)

IT **1333-74-0P**, Hydrogen, preparation
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)
(combustion of novel chemical mixts. for **hydrogen generation**)

IT **16940-66-2**, Sodium borohydride
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(combustion of novel chemical mixts. for **hydrogen generation**)

RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P**, Hydrogen, preparation
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)
(combustion of novel chemical mixts. for **hydrogen generation**)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 9 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1292155 HCAPLUS
DN 144:8521
TI **Hydrogen storage** mixed gas system method
IN Meyer, Martin S.; Pinkerton, Frederick E.; Meisner, Gregory P.
PA USA
SO U.S. Pat. Appl. Publ., 19 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005271581	A1	20051208	US 2004-860628	20040603
PRAI	US 2004-860628		20040603		

AB A system comprising solid media and a gaseous atmospheric, said solid media having a first condition which is hydrogenated and a second condition which is partially or fully dehydrogenated relative to said first condition, and wherein said gaseous atmospheric comprises nitrogen.
IC ICM C01B003-08
INCL 423658200; 423413000
CC 47-7 (Apparatus and Plant Equipment)
Section cross-reference(s): 48, 49
ST **hydrogen storage** mixed gas system
IT Gases
Storage
(**hydrogen storage** mixed gas system method)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium
amide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**hydrogen storage** mixed gas system method)
IT **12135-01-2**, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(**hydrogen storage** mixed gas system method)
IT **1333-74-0**, **Hydrogen**, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(**hydrogen storage** mixed gas system method)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium
amide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**hydrogen storage** mixed gas system method)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

IT 12135-01-2, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(hydrogen storage mixed gas system method)
RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

IT 1333-74-0, Hydrogen, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(hydrogen storage mixed gas system method)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

L58 ANSWER 10 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1249814 HCAPLUS
DN 144:315037
TI **Hydrogen storage** properties of Li-Mg-N-H systems
AU Nakamori, Y.; Kitahara, G.; Miwa, K.; Ohba, N.; Noritake, T.; Towata, S.; Orimo, S.
CS Institute for Materials Research, Tohoku University, Sendai, 980-8577, Japan
SO Journal of Alloys and Compounds (2005), 404-406, 396-398
CODEN: JALCEU; ISSN: 0925-8388
PB Elsevier B.V.
DT Journal
LA English
AB The hydriding and dehydriding reactions of M(NH2)y, where M = Li-x atomic% Mg(x = 0-100 and y = 1-2), were examined for the purpose of developing reversible **hydrogen storage** materials. At the start of the reaction, the dehydriding temps. of LiNH 2 with partial Mg substitutions drastically decrease with an increase in the Mg concns., to approx. 370 K with x = 30 . Moreover, the reversible dehydriding and rehydriding reactions of Mg(NH2)2, in which 9.1 mass% of **hydrogen** can be **stored**, were successively investigated. The reversible hydriding and dehydriding reactions of M(NH2)y are useful for the development of **hydrogen storage** materials for fuel cell applications.
CC 52-4 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST **hydrogen storage** lithium magnesium nitrogen system
IT Fuel cells
Storage
(**hydrogen storage** properties of Li-Mg-N-H systems)
IT **Amides**, uses
Imides
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES

(Uses)
(**hydrogen storage** properties of Li-Mg-N-H systems)
IT **1333-74-0, Hydrogen**, uses **7580-67-8**, Lithium hydride (LiH) **7782-89-0**, Lithium **amide** **7803-54-5**, Magnesium **amide** (Mg(NH2)2) 12057-71-5, Magnesium **nitride** (Mg3N2) **12135-01-2**, Lithium imide 26134-62-3, Lithium **nitride** (Li3N) **26134-80-5**, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen storage** properties of Li-Mg-N-H systems)
IT **1333-74-0, Hydrogen**, uses **7580-67-8**, Lithium hydride (LiH) **7782-89-0**, Lithium **amide** **7803-54-5**, Magnesium **amide** (Mg(NH2)2) **12135-01-2**, Lithium imide **26134-80-5**, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen storage** properties of Li-Mg-N-H systems)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

H_2N—Mg—NH_2

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 26134-80-5 HCAPLUS
CN Magnesium imide (Mg(NH)) (9CI) (CA INDEX NAME)

Mg═NH

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 11 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1231453 HCAPLUS
DN 144:24813
TI **Hydrogen Storage** of Li2NH Prepared by Reacting Li with NH3
AU Hu, Yun Hang; Ruckenstein, Eli
CS Department of Chemical Engineering, State University of New York, Amherst, NY, 14260, USA
SO Industrial & Engineering Chemistry Research (2006), 45(1), 182-186
CODEN: IECRED; ISSN: 0888-5885
PB American Chemical Society
DT Journal
LA English
AB In this paper, Li2NH was prepared by reacting Li particles with NH3 at 200°, followed by dehydrogenation at 280°. The obtained Li2NH particles reversibly absorb hydrogen and have slow kinetics during the first hydrogenation and much faster kinetics during the subsequent rehydrogenations. Furthermore, their hydrogen capacity increases with the cycle number After 15 cycles, the reversible hydrogen capacity increases to 3.1 weight% from the initial value of .apprx.2 weight%. A larger number of cycles
is expected to increase the hydrogen capacity.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **hydrogen storage** lithium imide prepn
IT 7439-93-2, Lithium, reactions 7664-41-7, Ammonia, reactions
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(**hydrogen storage** capacity of lithium imide prepared by reacting lithium with ammonia)
IT **1333-74-0, Hydrogen**, uses **12135-01-2**, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen storage** capacity of lithium imide prepared by reacting lithium with ammonia)
IT **1333-74-0, Hydrogen**, uses **12135-01-2**, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(**hydrogen storage** capacity of lithium imide prepared by reacting lithium with ammonia)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RE.CNT 56 THERE ARE 56 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 12 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1219247 HCAPLUS
DN 144:491783
TI Guidelines for developing **amide**-based **hydrogen storage** materials
AU Nakamori, Yuko; Kitahara, Gaku; Ninomiya, Akihito; Aoki, Masakazu; Noritake, Tatsuo; Towata, Shin-ichi; Orimo, Shin-ichi
CS Institute for Materials Research, Tohoku University, Sendai, 980-8577, Japan
SO Materials Transactions (2005), 46(9), 2093-2097
CODEN: MTARCE; ISSN: 1345-9678
PB Japan Institute of Metals
DT Journal
LA English
AB An effective method for developing **amide**-based high-performance **hydrogen storage** materials is to prepare appropriate combinations of **amides** and hydrides. Probably a mixture of an **amide** with a low decomposition temperature and a hydride showing rapid reaction to ammonia would be an appropriate combination. According to this proposal, the mixture of Mg(NH2)2 (Mg **amide**) and LiH (Li hydride) was studied. The dehydriding temperature of the mixture of Mg(NH2)2
and
4·LiH is lower than that of the mixture of LiNH2 (Li **amide**) and 2·LiH. A method for preventing ammonia release is increasing the LiH ratio in the mixts., which results in a reduction in the amount of desorbed hydrogen. The homogeneous dispersion between Mg(NH2)2 and LiH might be also an important factor for preventing ammonia release.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 78
ST **amide hydrogen storage** material lithium
sodium magnesium dehydriding hydriding; ammonia release limitation metal hydride **amide** blend **hydrogen storage**
IT Hydriding
(dehydriding; guidelines for developing **amide**-based **hydrogen storage** materials)
IT Nitriding
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT **Amides**, preparation
Hydrides
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT **Nitrides**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(intermediates to make metal **amides**; guidelines for developing **amide**-based **hydrogen storage** materials)
IT Thermal decomposition
(of hydrides; guidelines for developing **amide**-based **hydrogen storage** materials)

IT **Storage**
(of **hydrogen**; guidelines for developing **amide**-based **hydrogen storage** materials)
IT Hydriding
(of **nitrides** to made metal **amides**; guidelines for developing **amide**-based **hydrogen storage** materials)
IT **1333-74-0**, Hydrogen, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT 7664-41-7, Ammonia, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT **7580-67-8**, Lithium hydride (LiH) **7646-69-7**, Sodium hydride **7693-27-8**, Magnesium hydride
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT **7782-89-0P**, Lithium **amide** (Li(NH2)) **7782-92-5P**, Sodium **amide** (Na(NH2)) **7803-54-5P**, Magnesium **amide** (Mg(NH2)2)
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT 7439-93-2, Lithium, reactions 7440-23-5, Sodium, reactions 7727-37-9, Nitrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)
IT **12135-01-2**, Lithium imide (Li2(NH)) 866613-37-8, Magnesium **nitride** (Mg2N3)
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(phase formed during heating and dehydriding; guidelines for developing **amide**-based **hydrogen storage** materials)
IT 7439-95-4, Magnesium, reactions
RL: OCU (Occurrence, unclassified); RCT (Reactant); OCCU (Occurrence); RACT (Reactant or reagent)
(present in MgH2; guidelines for developing **amide**-based **hydrogen storage** materials)
IT **1333-74-0**, Hydrogen, formation (nonpreparative)
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(guidelines for developing **amide**-based **hydrogen storage** materials)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8**, Lithium hydride (LiH) **7646-69-7**, Sodium hydride **7693-27-8**, Magnesium hydride
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP

(Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7646-69-7 HCAPLUS
CN Sodium hydride (NaH) (8CI, 9CI) (CA INDEX NAME)

NaH

RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

IT **7782-89-0P**, Lithium **amide** (Li(NH2)) **7782-92-5P**, Sodium **amide** (Na(NH2)) **7803-54-5P**, Magnesium **amide** (Mg(NH2)2)
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(guidelines for developing **amide**-based **hydrogen storage** materials)

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 7782-92-5 HCAPLUS
CN Sodium amide (Na(NH2)) (9CI) (CA INDEX NAME)

H_2N-Na

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2N-Mg-NH_2$

IT **12135-01-2**, Lithium imide (Li2(NH))
RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)
(phase formed during heating and dehydriding; guidelines for developing **amide**-based **hydrogen storage** materials)

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RE.CNT 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 13 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1120356 HCAPLUS
DN 144:38241
TI Energetics of the Li **amide**/Li imide **hydrogen storage** reaction
AU Herbst, J. F.; Hector, L. G., Jr.
CS Materials and Processes Laboratory, General Motors R&D Center, Warren, MI, 48090-9055, USA
SO Physical Review B: Condensed Matter and Materials Physics (2005), 72(12), 125120/1-125120/8
CODEN: PRBMDO; ISSN: 1098-0121
PB American Physical Society
DT Journal
LA English
AB A d. functional theory study of the H storage reaction, LiNH2+LiH↔Li2NH+H2, is described. The electronic structure and enthalpy of formation, ΔH, of each constituent were calculated through the generalized gradient approximation (GGA) and the local d. approximation (LDA).
Zero point energies and finite temperature corrections to ΔH were derived via calcn. of the vibrational spectra. The GGA provides better agreement with experiment than the LDA for the structural parameters and for ΔH(LiNH2), ΔH(LiH), and the overall reaction enthalpy.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 65, 75
ST **hydrogen storage** lithium **amide** lithium imide energetics formation enthalpy
IT **7580-67-8**, Lithium hydride (LiH) **7782-89-0**, Lithium **amide** (Li(NH2)) **12135-01-2**, Lithium imide (Li2(NH))
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(energetics of Li **amide**/Li imide **hydrogen storage** reaction)
IT **1333-74-0**, Hydrogen, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(energetics of Li **amide**/Li imide **hydrogen storage** reaction)
IT **7580-67-8**, Lithium hydride (LiH) **7782-89-0**, Lithium **amide** (Li(NH2)) **12135-01-2**, Lithium imide (Li2(NH))
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(energetics of Li **amide**/Li imide **hydrogen storage** reaction)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS

CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

IT **1333-74-0**, Hydrogen, uses
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(energetics of Li **amide**/Li imide **hydrogen storage** reaction)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 14 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1112828 HCAPLUS
DN 145:30649
TI Research and development trend of inorganic **hydrogen storage** materials
AU Ichikawa, Takayuki; Fuji, Hironobu
CS Natural Science, Hiroshima University, 1-3-1 kagamiyama, Higashi-Hiroshima-shi, 739-8526, Japan
SO Journal of the Society of Inorganic Materials, Japan (2005), 12(318), 344-351
CODEN: JSIJFR; ISSN: 1345-3769
PB Society of Inorganic Materials, Japan
DT Journal; General Review
LA Japanese
AB A review on research and development trend of inorg. **hydrogen storage** materials such as activated carbon, nanoporous graphite, carbon nanotubes, MgH2, alkali metal alanates, alkaline earth metal alanates, trilithium **nitrides**, Mg(NH2)2, and Li3BN2H8.
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
ST review inorg **hydrogen storage** material
IT Nanotubes
(carbon; research and development trend of inorg. **hydrogen storage** materials)
IT 7782-42-5, Graphite, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nanoporous; research and development trend of inorg. **hydrogen storage** materials)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nanotubes; research and development trend of inorg. **hydrogen storage** materials)
IT **1333-74-0**, Hydrogen, uses **7693-27-8**, Magnesium hydride

7803-54-5, Magnesium **amide** (Mg(NH2)2) **13770-96-2**
, Sodium aluminum hydride 26134-62-3, Trilithium **nitride**
874891-56-2, Lithium boride hydride **nitride** (Li3BH8N2)
RL: TEM (Technical or engineered material use); USES (Uses)
(research and development trend of inorg. **hydrogen**
storage materials)

IT **1333-74-0**, Hydrogen, uses **7693-27-8**, Magnesium hydride
7803-54-5, Magnesium **amide** (Mg(NH2)2) **13770-96-2**
, Sodium aluminum hydride **874891-56-2**, Lithium boride hydride
nitride (Li3BH8N2)
RL: TEM (Technical or engineered material use); USES (Uses)
(research and development trend of inorg. **hydrogen**
storage materials)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

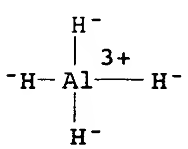
RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2N—Mg—NH_2$

RN 13770-96-2 HCAPLUS
CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)



● Na^+

RN 874891-56-2 HCAPLUS
CN Lithium boride hydride nitride (Li3BH8N2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	2	17778-88-0
H	8	12385-13-6
B	1	7440-42-8
Li	3	7439-93-2

L58 ANSWER 15 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:1052968 HCAPLUS
DN 143:480354
TI Decomposition kinetics of lithium **amide** and its implications for **hydrogen storage**
AU Pinkerton, Frederick E.
CS Materials and Processes Laboratory, General Motors Research and Development Center, Warren, MI, 48090-9055, USA
SO Materials Research Society Symposium Proceedings (2005), 837(Materials for Hydrogen Storage--2004), 137-142
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB Kinetics of the lithium **amide** (LiNH2) decomposition reaction 2 LiNH2 → Li2NH + NH3 were determined using TGA. LiNH2 is a primary component of the hydrided state of Li3N- and Li2NH-based storage materials. Its decomposition by ammonia release, and the resulting degradation of **hydrogen storage** capacity, has important implications for the durability of Li-N-H storage systems. Fine powders of LiNH2 were prepared by ball milling for 20 min. Kinetic parameters were extracted from a set of TGA weight loss curves taken at different heating rates between 1 and 20°/min, and the activation energy Ea is 124 kJ/mol. Although decomposition occurs slowly <300 °C, isothermal TGA measurements on Li3N demonstrate that its cumulative effect is large in real Li-N-H systems, where LiNH2-containing hydrided material is held at elevated temperature under dynamic gas flow.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 67, 69
ST decompn kinetics lithium **amide hydrogen storagenitride** ammonia prodn
IT Ball milling
Decomposition enthalpy
Decomposition kinetics
Heating
Hydriding
(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT Desorption
Storage
(of **hydrogen**; decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT **7782-89-0**, Lithium **amide** (Li(NH2))
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(component in **hydrogen storage** material; decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT 12057-24-8, Lithium oxide, occurrence
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)
(contaminant in lithium **amide**; decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT **12135-01-2P**, Lithium imide (Li2(NH))
RL: FMU (Formation, unclassified); RCT (Reactant); SPN (Synthetic preparation); FORM (Formation, nonpreparative); **PREP (Preparation)**; RACT (Reactant or reagent)

(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT 7664-41-7P, Ammonia, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT **1333-74-0**, Hydrogen, reactions 19597-69-4, Lithium azide (Li(N3))
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
IT **7782-89-0**, Lithium **amide** (Li(NH2))
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(component in **hydrogen storage** material; decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li— NH_2

IT **12135-01-2P**, Lithium imide (Li2(NH))
RL: FMU (Formation, unclassified); RCT (Reactant); SPN (Synthetic preparation); FORM (Formation, nonpreparative); **PREP (Preparation)**; RACT (Reactant or reagent)
(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li— NH— Li

IT **1333-74-0**, Hydrogen, reactions
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(decomposition kinetics of lithium **amide** and its implications for **hydrogen storage** in lithium azide)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 16 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:961461 HCAPLUS
DN 143:269720
TI Preparation of a **hydrogen storage** composition
IN Pinkerton, Frederick E.; Meyer, Martin S.; Meisner, Gregory P. applicants
PA USA

SO U.S. Pat. Appl. Publ., 14 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005191236	A1	20050901	US 2004-789899	20040227
	WO 2005091766	A2	20051006	WO 2005-US2356	20050127

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	US 2006057049	A1	20060316	US 2005-231543	20050921
PRAI	US 2004-789899	A	20040227		

AB A **hydrogen storage** composition is prepared having the general formula M'xM"yNzHd with M' being Li, Ca, Na, Mg, K, or Be, 50<x<53, M" being a group 13 element of the Periodic Table, 5<y<34, N being nitrogen, 16<z<45, and H being hydrogen and in a fully hydrogenated state, 110<d<177. The storage composition is prepared by reacting a hydride, especially LiBH4 or LiAlH4, with an **amide** or **nitride**, such as lithium **amide**, sodium **amide**, magnesium **amide**, lithium **nitride**, or magnesium imide, borazane, or lithium azide. A preferred composition is Li3BN2H8. The reaction is carried out by milling the reaction mixture The release of hydrogen is conducted at ≥ 210°.
IC ICM C01B021-092
INCL 423658200; 423413000
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **hydrogen storage** release compn hydride **amide** milling
IT Milling (size reduction)
(preparation of **hydrogen storage** composition)
IT **1333-74-0P**, **Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(preparation of **hydrogen storage** composition)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide** **7782-92-5**, Sodium **amide** **7803-54-5**, Magnesium **amide** (Mg(NH2)2) **13770-96-2**, Sodium aluminum hydride **13774-81-7**, Borazane **16853-85-3** **16903-37-0**, Magnesium borohydride mg(BH4)2 **16940-66-2**, Sodium borohydride **16949-15-8**, Lithium borohydride (LiBH4) 19597-69-4, Lithium azide 26134-62-3, Lithium **nitride** **26134-80-5**, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(preparation of **hydrogen storage** composition)
IT **93381-00-1P**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC

(Process)
(preparation of **hydrogen storage** composition)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(preparation of **hydrogen storage** composition)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide** **7782-92-5**, Sodium **amide** **7803-54-5**, Magnesium **amide** (Mg(NH2)2) **13770-96-2**, Sodium aluminum hydride **13774-81-7**, Borazane **16853-85-3** **16903-37-0**, Magnesium borohydride mg(BH4)2 **16940-66-2**, Sodium borohydride **16949-15-8**, Lithium borohydride (LiBH4) **26134-80-5**, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(preparation of **hydrogen storage** composition)

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li— NH_2

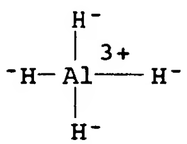
RN 7782-92-5 HCAPLUS
CN Sodium amide (Na(NH2)) (9CI) (CA INDEX NAME)

H_2N— Na

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

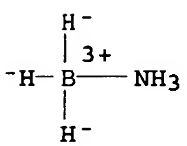
H_2N— Mg— NH_2

RN 13770-96-2 HCAPLUS
CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)

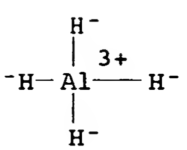


● Na^{+}

RN 13774-81-7 HCAPLUS
CN Boron, amminetrihydro-, (T-4)- (9CI) (CA INDEX NAME)

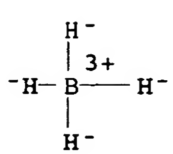


RN 16853-85-3 HCAPLUS
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



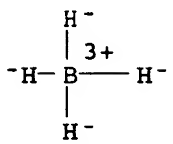
● Li^{+}

RN 16903-37-0 HCAPLUS
CN Borate(1-), tetrahydro-, magnesium (2:1) (9CI) (CA INDEX NAME)



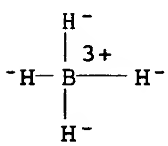
● 1/2 Mg^{2+}

RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



● Na^+

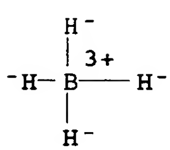
RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li^+

RN 26134-80-5 HCAPLUS
CN Magnesium imide (Mg(NH)) (9CI) (CA INDEX NAME)

IT **93381-00-1P**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)
(preparation of **hydrogen storage** composition)
RN 93381-00-1 HCAPLUS
CN Borate(1-), tetrahydro-, lithium, diammoniate (9CI) (CA INDEX NAME)



● Li^+

●2 NH_3

L58 ANSWER 17 OF 33 HCAPLUS
AN 2005:844119 HCAPLUS
DN 144:24811
TI Chemical reaction of **amides** and hydrides
AU Xiong, Zhitao; Hu, Jianjiang; Wu, Guotao; Chen, Ping
CS Physics Department, National University of Singapore, Singapore, 119542, Singapore
SO Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2005), 50(2), 501-502
CODEN: PSADFZ; ISSN: 1521-4648
PB American Chemical Society, Division of Fuel Chemistry
DT Journal; (computer optical disk)
LA English
AB Lithium and magnesium **amides** (LiNH2 and Mg(NH2)2) were reacted with hydrides (LiAlH4, MgH2, NaH and CaH2) in a planetary ball mill and the products studied. Hydrogen release of these materials during milling and then during temperature programmed desorption was then studied. Some samples desorbed hydrogen both during milling and heating, some only upon heating. Magnesium **amide** reaction products experience the majority of hydrogen desorption above 50 °C. FTIR was used to detect changes in N-H bonds during the reactions.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 78
ST **amide** hydride solid state reaction **hydrogen storage** desorption FTIR
IT Ball milling
Solid state reaction
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT Hydrides
RL: RCT (Reactant); RACT (Reactant or reagent)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT Bond
(hydrogen-nitrogen; chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT Desorption
Storage
(of **hydrogen**; chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT 7580-67-8DP, Lithium hydride, reaction products with magnesium **amide** 7693-27-8DP, Magnesium hydride (MgH2), reaction products with lithium **amide** or magnesium **amide** 7803-54-5DP, Magnesium **amide** (Mg(NH2)2), reaction products with lithium aluminum hydride, lithium hydride, sodium hydride, calcium hydride or magnesium hydride **16853-85-3DP**, reaction products with lithium **amide** or magnesium **amide**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT 7782-89-0, Lithium **amide** (Li(NH2))
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
IT 7646-69-7DP, Sodium hydride (NaH), reaction products with magnesium

amide 7782-89-0DP, Lithium **amide** (Li(NH2)), reaction products with lithium aluminum hydride or magnesium hydride 7789-78-8DP, Calcium hydride (CaH2), reaction products with magnesium **amide**
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

IT 7803-54-5P, Magnesium **amide** (Mg(NH2)2)
RL: PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

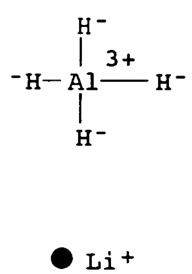
IT 7580-67-8, Lithium hydride 7646-69-7, Sodium hydride (NaH) 7664-41-7, Ammonia, reactions 7693-27-8, Magnesium hydride (MgH2) 7789-78-8, Calcium hydride (CaH2) **16853-85-3**
RL: RCT (Reactant); RACT (Reactant or reagent)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

IT 7439-95-4, Magnesium, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(nanoparticles; chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

IT **1333-74-0P**, **Hydrogen**, preparation
RL: ANT (Analyte); BYP (Byproduct); ANST (Analytical study); **PREP (Preparation)**
(**storage** materials for; chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

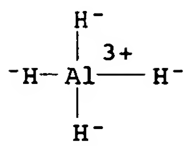
IT **16853-85-3DP**, reaction products with lithium **amide** or magnesium **amide**
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

RN 16853-85-3 HCAPLUS
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



IT **16853-85-3**
RL: RCT (Reactant); RACT (Reactant or reagent)
(chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)

RN 16853-85-3 HCAPLUS
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



● Li^{+}

IT 1333-74-0P, **Hydrogen**, preparation
RL: ANT (Analyte); BYP (Byproduct); ANST (Analytical study); **PREP (Preparation)**
(**storage** materials for; chemical reaction of **amides** and hydrides and use as **hydrogen storage** materials)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 18 OF 33 HCAPLUS
AN 2005:531242 HCAPLUS
DN 144:315019
TI **Hydrogen storage** for energy applications
AU Orimo, Shin-ichi; Nakamori, Yuko
CS Institute for Materials Research, Tohoku University, Sendai, 980-8577, Japan
SO JAERI-Review (2005), 2005-004, 175-189
CODEN: JERVE9
DT Report
LA English
AB The correlation between B-H atomistic vibrations in [BH4]-anion and melting temps. of MBH4 (M = Li, Na, and K) was studied as an index of H desorption (decomposition) temperature to explain the effect of the cation on the decrease of the H desorption temperature A method for decreasing the H desorption temperature of Li-based complex hydrides is partial cation substitution using smaller and/or higher valence cations with larger electronegativities. At the start of the reaction, the H desorption temperature of Li1-xMgx(NH2)y decreased, with an increase in Mg concentration, to .apprx.370 K for the sample with x = 0.3. This approach controls the stabilization of complex hydrides by decreasing the H desorption temperature and this effect is important for the fuel cell applications.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **hydrogen storage** borohydride lithium magnesium **amide** fuel cell
IT **1333-74-0**, **Hydrogen**, uses **13762-51-1**, Potassium borohydride (KBH4) **16940-66-2**, Sodium borohydride (NaBH4) **16949-15-8**, Lithium borohydride (LiBH4) **879867-23-9**

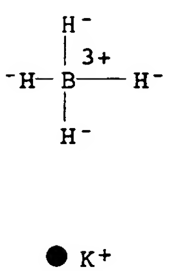
RL: TEM (Technical or engineered material use); USES (Uses)
(**hydrogen storage** in borohydrides and lithium magnesium **amides** for fuel cells)

IT **1333-74-0, Hydrogen**, uses **13762-51-1**, Potassium borohydride (KBH4) **16940-66-2**, Sodium borohydride (NaBH4) **16949-15-8**, Lithium borohydride (LiBH4) **879867-23-9**
RL: TEM (Technical or engineered material use); USES (Uses)
(**hydrogen storage** in borohydrides and lithium magnesium **amides** for fuel cells)

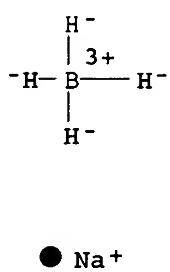
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

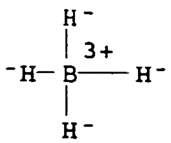
RN 13762-51-1 HCAPLUS
CN Borate(1-), tetrahydro-, potassium (8CI, 9CI) (CA INDEX NAME)



RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



● Li^+

RN 879867-23-9 HCAPLUS
CN INDEX NAME NOT YET ASSIGNED

Component	Ratio	Component Registry Number
H2N	1 - 2	17655-31-1
Mg	0 - 1	7439-95-4
Li	0 - 1	7439-93-2

L58 ANSWER 19 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:300353 HCAPLUS
DN 142:376622
TI Multi-metal-nitrogen compounds for use in **hydrogen storage** materials
IN Chen, Ping; Xiong, Zhitao
PA National University of Singapore, Singapore
SO PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005030637	A1	20050407	WO 2004-SG317	20040929

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2003-507548P P 20031002
US 2004-571804P P 20040517

AB A multi-metal-nitrogen compound for use in **hydrogen storage** materials contains at least two different metals, especially Al, Ca, Li, Mg, and/or Na, and a nitrogen atom. The multi-metal-nitrogen compound is capable of absorbing hydrogen at an absorption temperature and pressure, and of desorbing at least 60% of the absorbed hydrogen at a desorption temperature and pressure. The compound is capable of absorbing and desorbing hydrogen at 0-200°. A The multi-metal-nitrogen compound can have the general formula LixAlyNHn where 0 < x < 3, 0 < y < 1, and n

≥ |3-x-3y|; LixMgyNHn, or LixCayNHn where 0 < x < 3, 0 < y < 1.5, and n ≥ |3-x-2y|; MgxCayNHn, MgxNayNHn, or MgxAlyNHn where 0 < x < 1.5, 0 < y < 1.5, and n ≥ |3-2x-2y|;.

IC ICM C01B003-04
ICS C01B003-08; C01B006-04; C01B006-06; C01B021-00; C01B021-06

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49

ST metal nitrogen compd imide **hydrogen storage** reversible

IT Imides
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

IT **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

IT **7789-78-8DP**, Calcium hydride, r.p. with lithium **amide**
849418-43-5P, Lithium magnesium hydride **nitride**
(Li1.5Mg0.5H0.5N) **849418-44-6P**, Magnesium sodium hydride
nitride (Mg0.5Na0.5H1.5N) **849418-45-7P**, Calcium
magnesium imide (Ca0.5Mg0.5(NH)) **849418-52-6P**, Lithium magnesium
hydride **nitride** (Li2Mg0.62H0.25N)
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process); USES (Uses)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

IT **7693-27-8**, Magnesium hydride **7693-27-8D**, Magnesium
hydride, r.p. with lithium **amide** **7782-89-0**, Lithium
amide **7789-78-8**, Calcium hydride (CaH2)
12135-01-2, Lithium imide **12135-01-2D**, Lithium imide,
r.p with magnesium hydride or calcium hydride **88676-47-5**, Sodium
imide (Na2(NH))
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

IT **1333-74-0**, **Hydrogen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage**; multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

IT **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

RN 828935-66-6 HCAPLUS
CN Lithium magnesium imide (Li2Mg(NH)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
HN	2	32323-01-6
Mg	1	7439-95-4
Li	2	7439-93-2

IT **7789-78-8DP**, Calcium hydride, r.p. with lithium **amide**

849418-43-5P, Lithium magnesium hydride **nitride** (Li1.5Mg0.5H0.5N) **849418-44-6P**, Magnesium sodium hydride **nitride** (Mg0.5Na0.5H1.5N) **849418-45-7P**, Calcium magnesium imide (Ca0.5Mg0.5(NH)) **849418-52-6P**, Lithium magnesium hydride **nitride** (Li2Mg0.62H0.25N)
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process); USES (Uses)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

RN 7789-78-8 HCAPLUS
CN Calcium hydride (CaH2) (8CI, 9CI) (CA INDEX NAME)

CaH_2

RN 849418-43-5 HCAPLUS
CN Lithium magnesium hydride nitride (Li1.5Mg0.5H0.5N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
H	0.5	12385-13-6
Mg	0.5	7439-95-4
Li	1.5	7439-93-2

RN 849418-44-6 HCAPLUS
CN Magnesium sodium hydride nitride (Mg0.5Na0.5H1.5N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
H	1.5	12385-13-6
Na	0.5	7440-23-5
Mg	0.5	7439-95-4

RN 849418-45-7 HCAPLUS
CN Calcium magnesium imide (Ca0.5Mg0.5(NH)) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
HN	1	32323-01-6
Ca	0.5	7440-70-2
Mg	0.5	7439-95-4

RN 849418-52-6 HCAPLUS
CN Lithium magnesium hydride nitride (Li2Mg0.62H0.25N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
H	0.25	12385-13-6
Mg	0.62	7439-95-4
Li	2	7439-93-2

IT **7693-27-8**, Magnesium hydride **7693-27-8D**, Magnesium hydride, r.p. with lithium **amide** **7782-89-0**, Lithium **amide** **7789-78-8**, Calcium hydride (CaH2) **12135-01-2**, Lithium imide **12135-01-2D**, Lithium imide, r.p with magnesium hydride or calcium hydride **88676-47-5**, Sodium imide (Na2(NH))
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

RN 7789-78-8 HCAPLUS
CN Calcium hydride (CaH2) (8CI, 9CI) (CA INDEX NAME)

CaH_2

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 88676-47-5 HCAPLUS
CN Sodium imide (Na2(NH)) (9CI) (CA INDEX NAME)

Na—NH—Na

IT **1333-74-0**, **Hydrogen**, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage**; multi-metal-nitrogen compds. for use in **hydrogen storage** materials)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 20 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:275653 HCAPLUS
DN 142:319896
TI Lithium **nitride** for **hydrogen storage**
IN Shindo, Kazuhiko; Kondo, Toshihiko
PA Nippon Telegraph and Telephone Corp., Japan 2
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2005082447	A2	20050331	JP 2003-316472	20030909
PRAI	JP 2003-316472		20030909		

AB The claimed compound is Li3N with average particle size ≤10 μm, which is obtained by heat treatment of metal Li in a N atmospheric and mech. milling. Preferably, the Li3N is activated with H before, after, or during the mech. milling process for producing Li2NH. The Li3N can store ≥5 weight% of H, and has short H absorption/release cycles at low temperature (150°).

IC ICM C01B003-00
ICS C01B021-06; H01M008-04
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST lithium **nitride hydrogen storage** compd; mech milling lithium **nitride hydrogen storage**
IT Milling (size reduction)
(Li3N with small average particle size obtained by mech. milling for H storage)
IT 26134-62-3P, Lithium **nitride** (Li3N)
RL: IMF (Industrial manufacture); RCT (Reactant); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses)
(Li3N with small average particle size obtained by mech. milling for H storage)
IT **12135-01-2P**, Lithium imide (Li2(NH))
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(Li3N with small average particle size obtained by mech. milling for H storage)
IT **1333-74-0**, Hydrogen, uses
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(Li3N with small average particle size obtained by mech. milling for H storage)

IT 7439-93-2, Lithium, reactions 7727-37-9, Nitrogen, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(Li3N with small average particle size obtained by mech. milling for H storage)

IT **12135-01-2P**, Lithium imide (Li2(NH))
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)
(Li3N with small average particle size obtained by mech. milling for H storage)

RN 12135-01-2 HCAPLUS

CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li— NH— Li

IT **1333-74-0**, Hydrogen, uses
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(Li3N with small average particle size obtained by mech. milling for H storage)

RN 1333-74-0 HCAPLUS

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

L58 ANSWER 21 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:182071 HCAPLUS

DN 142:222681

TI Combinations of **hydrogen storage** materials including **amide**/imide

IN Meisner, Gregory P.; Balogh, Michael P.

PA General Motors Corporation, USA

SO U.S. Pat. Appl. Publ., 9 pp.
CODEN: USXXCO

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2005047994	A1	20050303	US 2003-649923	20030826
	US 7029649	B2	20060418		
	WO 2005023706	A2	20050317	WO 2004-US20405	20040624
	WO 2005023706	A3	20050630		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

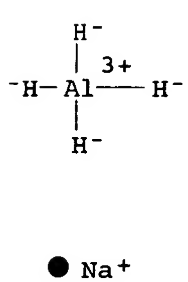
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI US 2003-649923 A 20030826

AB Hydrogen gas is reversibly produced by mixing an **amide** and a

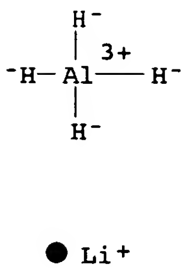
hydride; followed by heating the mixed materials at a temperature sufficient to release hydrogen. The heating is conducted in two stages wherein in the 1st stage alanate is decomposed in the presence of an **amide** to release hydrogen and to produce a hydride and aluminum, and a 2nd stage where the **amide** and the hydride react in the presence of aluminum to produce more hydrogen and an imide. The imide is regenerated to form an **amide.** The hydride can be LiAlH4, NaAlH4, LiBH4, or NaBH4. The **amide** is preferably LiNH2. A **hydrogen storage** medium is based on this reaction including a hydrogenated and a dehydrogenated state.

IC ICM C01B003-06
INCL 423658200
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST **hydrogen storage** medium **amide** alanate imide formation
IT 7580-67-8, Lithium hydride
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); RCT (Reactant); FORM (Formation, nonpreparative); PROC (Process); RACT (Reactant or reagent)
(combinations of **hydrogen storage** materials including **amide**/imide)
IT 7782-89-0, Lithium **amide** (Li(NH2)) **13770-96-2**, Aluminum sodium hydride (AlNaH4) **16853-85-3** **16940-66-2**, Sodium borohydride (NaBH4) **16949-15-8**, Lithium borohydride (LiBH4)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(combinations of **hydrogen storage** materials including **amide**/imide)
IT **1333-74-0P, Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(**storage**; combinations of **hydrogen storage** materials including **amide**/imide)
IT **13770-96-2**, Aluminum sodium hydride (AlNaH4) **16853-85-3** **16940-66-2**, Sodium borohydride (NaBH4) **16949-15-8**, Lithium borohydride (LiBH4)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(combinations of **hydrogen storage** materials including **amide**/imide)
RN 13770-96-2 HCAPLUS
CN Aluminate(1-), tetrahydro-, sodium, (T-4)- (9CI) (CA INDEX NAME)

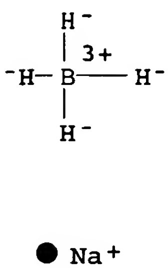


RN 16853-85-3 HCAPLUS

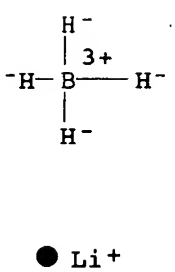
CN Aluminate(1-), tetrahydro-, lithium, (T-4)- (9CI) (CA INDEX NAME)



RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P, Hydrogen**, preparation
RL: CPS (Chemical process); IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); **PREP (Preparation)**; PROC (Process)
(**storage**; combinations of **hydrogen storage** materials including **amide**/imide)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

L58 ANSWER 22 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:138883 HCAPLUS
DN 142:222006
TI **Hydrogen-storing** materials and their manufacture and manufacturing apparatus
IN Fujii, Hironobu; Ichikawa, Takayuki; Leng, Haiyan; Isobe, Shigehito; Hanada, Nobuko; Kubokawa, Toyoyuki; Tokoyoda, Kazuhiko; Okamoto, Keisuke; Tanabe, Shinkichi; Matsuura, Shigeru; Ogawa, Kenji
PA National University Corporation Hiroshima University, Japan; Taiheiyo Cement Corporation
SO PCT Int. Appl., 169 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2005014165	A1	20050217	WO 2004-JP9538	20040705

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	JP 2005126273	A2	20050519	JP 2003-362943	20031023
	JP 2005154232	A2	20050616	JP 2003-398542	20031128
	JP 2004306016	A2	20041104	JP 2004-36967	20040213
	JP 2005281047	A2	20051013	JP 2004-96074	20040329
	JP 2005279418	A2	20051013	JP 2004-96075	20040329
	JP 2005282828	A2	20051013	JP 2004-101759	20040331
	JP 2005281115	A2	20051013	JP 2004-101948	20040331
	JP 2005291227	A2	20051020	JP 2004-102773	20040331
	JP 2006008440	A2	20060112	JP 2004-186449	20040624
	JP 2006008441	A2	20060112	JP 2004-186450	20040624
	JP 2006007064	A2	20060112	JP 2004-186451	20040624
	JP 2005095869	A2	20050414	JP 2004-232091	20040809
	JP 2005306724	A2	20051104	JP 2005-79096	20050318
	US 2006127304	A1	20060615	US 2006-351244	20060209
PRAI	JP 2003-291672	A	20030811		
	JP 2003-362943	A	20031023		
	JP 2003-398542	A	20031128		
	JP 2004-36967	A	20040213		
	JP 2004-86925	A	20040324		
	JP 2004-96074	A	20040329		
	JP 2004-96075	A	20040329		
	JP 2004-101759	A	20040331		
	JP 2004-101948	A	20040331		
	JP 2004-102773	A	20040331		
	JP 2004-144850	A	20040514		
	JP 2004-186449	A	20040624		
	JP 2004-186450	A	20040624		
	JP 2004-186451	A	20040624		
	JP 2003-86300	A	20030326		
	WO 2004-JP9538	A1	20040705		

AB The title materials are composed of lithium-imide-compound precursor composites having a nano-structure, whereas the lithium-imide-compound precursor composites are manufactured by mixing of fine lithium **amide** powder with fine lithium hydride powder, and composition treatment(e.g., mech. milling).
IC ICM B01J020-04
ICS B01J020-30; C01B003-00; B01J003-00; H01M008-06
CC 49-1 (Industrial Inorganic Chemicals)
Section cross-reference(s): 52
ST **hydrogen storage** material manuf app
IT **1333-74-0, Hydrogen,** processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**hydrogen-storing** materials and their manufacture and manufacturing apparatus)
IT **7580-67-8,** Lithium hydride **7782-89-0,** Lithium **amide**
RL: TEM (Technical or engineered material use); USES (Uses)
(powder; in manufacture of **hydrogen-storing** materials)
IT **12135-01-2,** Lithium imide
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(precursor, composites; **hydrogen-storing** materials and their manufacture and manufacturing apparatus)
IT **1333-74-0, Hydrogen,** processes
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(**hydrogen-storing** materials and their manufacture and manufacturing apparatus)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8,** Lithium hydride **7782-89-0,** Lithium **amide**
RL: TEM (Technical or engineered material use); USES (Uses)
(powder; in manufacture of **hydrogen-storing** materials)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

IT **12135-01-2,** Lithium imide
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(precursor, composites; **hydrogen-storing** materials and their manufacture and manufacturing apparatus)
RN 12135-01-2 HCAPLUS

CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 23 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2005:976 HCAPLUS
DN 142:77674
TI Imide/**amide hydrogen storage** system
IN Meisner, Gregory P.; Pinkerton, Frederick E.; Meyer, Martin S.; Balogh, Michael P.; Kundrat, Matthew D.
PA General Motors Corporation, USA
SO U.S. Pat. Appl. Publ., 8 pp.
CODEN: USXXCO
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2004265226	A1	20041230	US 2003-603474	20030625
	US 6967012	B2	20051122		
	US 2004265222	A1	20041230	US 2004-824876	20040415
	WO 2005005310	A2	20050120	WO 2004-US16529	20040525
	WO 2005005310	A3	20050630		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRAI	US 2003-603474	A3	20030625
	US 2004-824876	A	20040415

AB **Hydrogen** is **stored** by contacting gaseous **hydrogen** with an imide Mc(NH)-2c/2 forming an **amide** Md(NH2)d-1 and a hydride. Preferably, Li2NH reacts with H2 to LiNH2 and LiH or MgNH reacts with H2 to Mg(NH2)2 and MgH2. The hydrogen can be released by ball milling the **amide** and the hydride under an inert gas atmospheric and heating.
IC ICM C01B021-087
INCL 423658200; X42-341.3
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49
ST metal imide **amide** hydride **hydrogen storage** system
IT Ball milling
(imide/**amide hydrogen storage** system)
IT **7693-27-8**, Magnesium hydride **7803-54-5**, Magnesium **amide** (Mg(NH2)2)
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); FORM (Formation, nonpreparative); PROC (Process)

(imide/**amide hydrogen storage** system)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium
amide 26134-62-3, Lithium **nitride 26134-80-5**
, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(imide/**amide hydrogen storage** system)
IT **12135-01-2P**, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); SPN (Synthetic preparation); **PREP**
(Preparation); PROC (Process); RACT (Reactant or reagent)
(imide/**amide hydrogen storage** system)
IT **1333-74-0**, **Hydrogen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); PROC (Process)
(**storage**; imide/**amide hydrogen**
storage system)
IT **7693-27-8**, Magnesium hydride **7803-54-5**, Magnesium
amide (Mg(NH2)2)
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical,
engineering or chemical process); FORM (Formation, nonpreparative); PROC
(Process)
(imide/**amide hydrogen storage** system)
RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RN 7803-54-5 HCAPLUS
CN Magnesium amide (Mg(NH2)2) (7CI, 8CI, 9CI) (CA INDEX NAME)

$H_2N-Mg-NH_2$

IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium
amide 26134-80-5, Magnesium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(imide/**amide hydrogen storage** system)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 26134-80-5 HCAPLUS
CN Magnesium imide (Mg(NH)) (9CI) (CA INDEX NAME)

Mg==NH

IT **12135-01-2P**, Lithium imide
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process); RACT (Reactant or reagent)
(imide/**amide hydrogen storage** system)
RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

IT **1333-74-0, Hydrogen**, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**storage**; imide/**amide hydrogen storage** system)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 24 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:977892 HCAPLUS
DN 143:250947
TI (LiNH2-MgH2): a viable **hydrogen storage** system.
[Erratum to document cited in CA142:159359]
AU Luo, Weifang
CS nalytical Material Science Department, Sandia National Laboratories, Livermore, CA, 94550, USA
SO Journal of Alloys and Compounds (2004), 385(1-2), 316
CODEN: JALCEU; ISSN: 0925-8388
PB Elsevier B.V.
DT Journal
LA English
AB The corrected version of Table 1 "Formation/decomposition enthalpies for samples 1 and 2" is given.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST erratum lithium magnesium **amide** imide hydride **hydrogen storage** system; dehydrogenation hydrogenation reversible lithium **amide** magnesium hydride erratum
IT Pressure
(effect on **hydrogen storage** capacity; lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
IT Fuel cells
(hydrides, **amides**, and imides for **hydrogen storage** for; lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
IT Dehydrogenation

Hydrogenation
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **Storage**
(of **hydrogen**; lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **12135-01-2**, Lithium imide (Li2(NH)) **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **1333-74-0**, Hydrogen, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **7782-89-0**, Lithium **amide** (Li(NH2))
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **7580-67-8**, Lithium hydride (LiH)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **7693-27-8**, Magnesium hydride (MgH2) 26134-62-3, Lithium **nitride** (Li3N)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

IT **12135-01-2**, Lithium imide (Li2(NH)) **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen** **storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 828935-66-6 HCAPLUS
CN Lithium magnesium imide (Li2Mg(NH)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number

HN	2	32323-01-6
Mg	1	7439-95-4
Li	2	7439-93-2

IT **1333-74-0**, Hydrogen, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-89-0**, Lithium **amide** (Li(NH2))
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

IT **7580-67-8**, Lithium hydride (LiH)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

IT **7693-27-8**, Magnesium hydride (MgH2)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity (Erratum))
RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

L58 ANSWER 25 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:832248 HCAPLUS
DN 142:159359

TI (LiNH2-MgH2): a viable **hydrogen storage** system
AU Luo, Weifang
CS Analytical Material Science Department, MS 9403, Sandia National Laboratories, Livermore, CA, 94550, USA
SO Journal of Alloys and Compounds (2004), 381(1-2), 284-287
CODEN: JALCEU; ISSN: 0925-8388
PB Elsevier B.V.
DT Journal
LA English
AB One of the problems related to the employment of hydrogen-based fuel cells for vehicular transportation is on board storage. **Hydrogen storage** in solids has long been recognized as one of the most practical approaches for this purpose. The capacity of existing storage materials is markedly below that needed for vehicular use. Recently Chen et al. (2002 and 2003) reported a lithium **nitride**/imide system, with a high capacity, 11.5%, however, its operating temperature and pressure are
not satisfactory for vehicular application. In this research a new storage material was developed, which is from the partial substitution of lithium by magnesium in the **nitride**/imide system. The plateau pressure of this new Mg-substituted system is .apprx.30 bar and 200° with a H capacity of 4.5% and possibly higher. This is a very promising H-storage material for on-board storage for vehicular applications.
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST lithium magnesium **amide** imide hydride **hydrogen storage** dehydrogenation hydrogenation
IT Pressure
(effect on **hydrogen storage** capacity; lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT Fuel cells
(hydrides, **amides**, and imides for **hydrogen storage** for; lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT Dehydrogenation
Hydrogenation
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT **Storage**
(of **hydrogen**; lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT **12135-01-2**, Lithium imide (Li2(NH)) **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT **1333-74-0**, Hydrogen, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
IT **7782-89-0**, Lithium **amide** (Li(NH2))

RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)

IT **7580-67-8**, Lithium hydride (LiH)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)

IT **7693-27-8**, Magnesium hydride (MgH2) 26134-62-3, Lithium **nitride** (Li3N)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)

IT **12135-01-2**, Lithium imide (Li2(NH)) **828935-66-6**, Lithium magnesium imide (Li2Mg(NH)2)
RL: FMU (Formation, unclassified); PRP (Properties); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 828935-66-6 HCAPLUS
CN Lithium magnesium imide (Li2Mg(NH)2) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
HN	2	32323-01-6
Mg	1	7439-95-4
Li	2	7439-93-2

IT **1333-74-0**, Hydrogen, reactions
RL: FMU (Formation, unclassified); RCT (Reactant); FORM (Formation, nonpreparative); RACT (Reactant or reagent)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7782-89-0**, Lithium **amide** (Li(NH2))
RL: PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation

capacity)
RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

IT **7580-67-8**, Lithium hydride (LiH)
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

IT **7693-27-8**, Magnesium hydride (MgH2)
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)
(lithium **amide**-magnesium hydride as viable **hydrogen storage** system with reversible hydrogenation-dehydrogenation capacity)
RN 7693-27-8 HCAPLUS
CN Magnesium hydride (MgH2) (7CI, 8CI, 9CI) (CA INDEX NAME)

MgH_2

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 26 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:807514 HCAPLUS
DN 141:352677
TI **Hydrogen storage** of metal **nitride** by a mechanochemical reaction
AU Kojima, Yoshitsugu; Kawai, Yasuaki
CS Toyota Central R&D Labs., Inc., Aichi, 480-1192, Japan
SO Chemical Communications (Cambridge, United Kingdom) (2004), (19), 2210-2211
CODEN: CHCOFS; ISSN: 1359-7345
PB Royal Society of Chemistry
DT Journal
LA English
AB Metal imides (Li2NH, CaNH), a metal **amide** (LiNH2) and metal hydrides (LiH, CaH2) were synthesized by ball milling of their resp. metal **nitrides** (Li3N, Ca3N2) in a H2 atmosphere at 1 MPa at room temperature
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 78
ST **hydrogen storage** metal **nitride** mechanochem reaction ball milling
IT Mechanochemical reaction
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)

IT **Nitrides**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)
IT **1333-74-0, Hydrogen,** processes 12013-82-0, Calcium **nitride** (Ca3N2) 26134-62-3, Lithium **nitride** (Li3N)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)
IT **7580-67-8P**, Lithium hydride (LiH) **7782-89-0P**, Lithium **amide** (Li(NH2)) **7789-78-8P**, Calcium hydride (CaH2) **12135-01-2P**, Lithium imide (Li2(NH)) **12400-28-1P**, Calcium imide (Ca(NH))
RL: PNU (Preparation, unclassified); **PREP (Preparation)**
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)
IT **1333-74-0, Hydrogen,** processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8P**, Lithium hydride (LiH) **7782-89-0P**, Lithium **amide** (Li(NH2)) **7789-78-8P**, Calcium hydride (CaH2) **12135-01-2P**, Lithium imide (Li2(NH)) **12400-28-1P**, Calcium imide (Ca(NH))
RL: PNU (Preparation, unclassified); **PREP (Preparation)**
(**hydrogen storage** by metal **nitrides** through mechanochem. reactions)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

RN 7789-78-8 HCAPLUS
CN Calcium hydride (CaH2) (8CI, 9CI) (CA INDEX NAME)

CaH_2

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 12400-28-1 HCAPLUS
CN Calcium imide (Ca(NH)) (7CI, 9CI) (CA INDEX NAME)

Ca==NH

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 27 OF 33 HCAPLUS
AN 2004:462797 HCAPLUS
DN 141:9641
TI Compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst
IN Kravitz, Stanley H.; Hecht, Andrew M.; Sylwester, Alan P.; Bell, Nelson S.
PA Sandia Corporation, USA
SO U.S., 8 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6746496	B1	20040608	US 2002-191900	20020709
PRAI	US 2002-349015P	P	20020115		

AB A compact solid source of hydrogen gas is described, in which **H2** is **generated** by contacting water with micro-disperse particles of sodium borohydride (NaBH4) in the presence of a catalyst, such as cobalt or ruthenium. The micro-disperse particles can have a uniform diameter of 1-10 μ (preferably .apprx.3-5 μ). Ruthenium or cobalt catalytic nanoparticles can be incorporated in the micro-disperse particles of NaBH4, which allows a rapid and complete reaction to occur without the problems associated with caking and scaling of the surface by the reactant product sodium metaborate. A closed-loop water management system can be used to recycle wastewater from a PEM (proton-exchange-membrane) fuel cell to supply water for reaction with the micro-disperse particles of NaBH4 in the generator. Capillary forces can wick water from a water reservoir into a packed bed of micro-disperse fuel particles, eliminating the need for use of an active pump.
IC ICM C10J003-20
INCL 048118500; 048061000; 048120000; 048174000; 422162000; 422211000; 422234000; 422236000; 422238000; 422240000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **hydrogen** gas **generator** borohydride hydrolysis; cobalt ruthenium hydrolysis catalyst borohydride **hydrogen generator**; proton exchange membrane fuel cell water hydrolysis borohydride
IT Hydrolysis catalysts
(for borohydride salts; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)
IT Gas **generators**
(**hydrogen**; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and

ruthenium catalyst)

IT Fuel cells
(proton exchange membrane, water reactant from; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

IT **16940-66-2**, Sodium borohydride (NaBH4)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(hydrolysis of; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

IT 7732-18-5, Water, uses
RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(hydrolysis reagent; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

IT 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses
RL: CAT (Catalyst use); USES (Uses)
(nanoparticles, hydrolysis catalyst; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

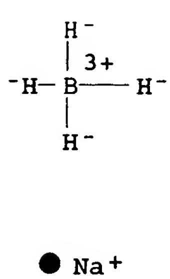
IT **1333-74-0P**, Hydrogen, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(production of; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

IT 7440-21-3, Silicon, uses 12033-89-5, Silicon **nitride** (Si3N4), uses
RL: DEV (Device component use); USES (Uses)
(substrate; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

IT **16940-66-2**, Sodium borohydride (NaBH4)
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(hydrolysis of; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

RN 16940-66-2 HCAPLUS

CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



IT **1333-74-0P**, Hydrogen, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(production of; compact solid source of hydrogen by controlled hydrolysis of sodium borohydride with water in presence of cobalt and ruthenium catalyst)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 28 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:363485 HCAPLUS
DN 140:381348
TI Mechanism of Novel Reaction from LiNH2 and LiH to Li2NH and **H2** as a Promising **Hydrogen Storage** System
AU Ichikawa, Takayuki; Hanada, Nobuko; Isobe, Shigehito; Leng, Haiyan; Fujii, Hironobu
CS Natural Science Center for Basic Research and Development, Hiroshima University, Higashi-Hiroshima, 739-8526, Japan
SO Journal of Physical Chemistry B (2004), 108(23), 7887-7892
CODEN: JPCBFK; ISSN: 1520-6106
PB American Chemical Society
DT Journal
LA English
AB The mechanism of the hydrogen desorption (HD) reaction from the 1:1 mixture of lithium **amide** (LiNH2) and lithium hydride (LiH) to lithium imide (Li2NH) and hydrogen (H2) has been proposed on the basis of our exptl. results in this paper. The proposed model is constituted by 2 kinds of elementary reactions: the one is that 2LiNH2 decomps. to Li2NH and ammonia (NH3), the other is that the emitted NH3 reacts with LiH and transforms into LiNH2 and H2. Since the former and the latter reactions are, resp., endothermic and exothermic, the HD reaction corresponding to the latter reaction occurs as soon as LiNH2 has decomposed into Li2NH and NH3. Therefore, the HD reaction can be understood by the following processes: at the first step, LiNH2 decomps. into Li2NH/2 + NH3/2, and then the emitted NH3/2 quickly reacts with LiH/2, transforming into LiNH2/2 + H2/2; at the second one, the produced LiNH2/2 decomps. to Li2NH/4 + NH3/4, and then NH3/4 + LiH/4 transform to LiNH2/4 + H2/4, and such successive steps continue until LiNH2 and LiH completely transform into Li2NH and H2, even at low temps., by the catalytic effect of TiCl3.
CC 67-3 (Catalysis, Reaction Kinetics, and Inorganic Reaction Mechanisms)
Section cross-reference(s): 52, 66
ST mechanism reaction lithium **amide** hydride **hydrogen storage** system; imide lithium formation **hydrogen storage** system; titanium chloride catalyst mechanism reaction lithium **amide** hydride
IT Catalysts
Desorption
Reaction mechanism
(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)
IT 7705-07-9, Titanium trichloride, uses
RL: CAT (Catalyst use); USES (Uses)
(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)
IT **1333-74-0**, Hydrogen, properties **12135-01-2**, Lithium imide
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)

(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)

IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)

IT **1333-74-0**, Hydrogen, properties **12135-01-2**, Lithium imide
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)
(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide**
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(mechanism of reaction from LiNH2 and LiH to Li2NH and **H2** as promising **hydrogen storage** system)

RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

Li—NH_2

RE.CNT 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 29 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2004:58220 HCAPLUS
DN 141:263271
TI Development of high capacity lithium based **hydrogen storage** materials
AU Ichikawa, Takayuki; Fujii, Horonobu

CS Dep. of Natural Science Research and Development Center, Hiroshima University, Japan
SO Kinzoku (2003), 73(11), 1110
CODEN: KNZKAI; ISSN: 0368-6337
PB Agune Gijutsu Senta
DT Journal
LA Japanese
AB The hydrogen release characteristics of LiNH2-LiH system were investigated as a part of study on **hydrogen storage** materials. The H release characteristics is significantly improved in the presence of TiCl3 catalyst.
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 66
ST **hydrogen storage** material lithium imide hydride;
lithium **amide** hydride system hydrogen release characteristics
IT 7705-07-9, Titanium trichloride, uses
RL: CAT (Catalyst use); USES (Uses)
(hydrogen release catalyst for lithium **amide**-lithium hydride system)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide** **12135-01-2**, Lithium imide
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**hydrogen storage** material lithium imide-lithium hydride-lithium **amide** system system)
IT **1333-74-0**, Hydrogen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(lithium imide-lithium hydride-lithium **amide** system system for storage of)
IT **7580-67-8**, Lithium hydride **7782-89-0**, Lithium **amide** **12135-01-2**, Lithium imide
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(**hydrogen storage** material lithium imide-lithium hydride-lithium **amide** system system)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 7782-89-0 HCAPLUS
CN Lithium amide (Li(NH2)) (7CI, 8CI, 9CI) (CA INDEX NAME)

$Li-NH_2$

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

IT **1333-74-0**, Hydrogen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(lithium imide-lithium hydride-lithium **amide** system system
for storage of)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

L58 ANSWER 30 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:356361 HCAPLUS
DN 138:356277
TI Method for reversible **storage** of **hydrogen** in
solid-state materials
IN Chen, Ping; Xiong, Zhitao; Luo, Jizhong
PA National University of Singapore, Singapore
SO PCT Int. Appl., 40 pp.
CODEN: PIXXD2
DT Patent
LA English
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2003037784	A2	20030508	WO 2002-SG254	20021030
	WO 2003037784	A3	20031016		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	EP 1451096	A2	20040901	EP 2002-783959	20021030

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	CN 1610645	A	20050427	CN 2002-826485	20021030
	US 2003129126	A1	20030710	US 2002-286924	20021031
	US 6946112	B2	20050920		
PRAI	US 2001-330802P	P	20011031		
	WO 2002-SG254	W	20021030		

AB Metal-N-based or metalloid-N-based materials absorb a substantial amount hydrogen and are useful as **hydrogen storage** materials for various applications such as hydrogen fuel cell technol.
IC ICM C01B003-00
CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)
ST **hydrogen storage** solid state material; fuel ceil
hydrogen storage solid state material
IT Nanotubes
(carbon; method for reversible **storage** of **hydrogen**
in solid-state materials)
IT Rare earth metals, uses
RL: MOA (Modifier or additive use); USES (Uses)
(dopant; method for reversible **storage** of **hydrogen**
in solid-state materials)
IT Absorption
Fuel cells

(method for reversible **storage** of **hydrogen** in
solid-state materials)
IT 7429-90-5, Aluminum, uses 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-21-3, Silicon, uses 7440-31-5, Tin, uses 7440-32-6, Titanium, uses 7440-41-7, Beryllium, uses 7440-42-8, Boron, uses 7440-47-3, Chromium, uses 7440-48-4, Cobalt, uses 7440-50-8, Copper, uses 7440-56-4, Germanium, uses 7440-66-6, Zinc, uses 7440-70-2, Calcium, uses 7704-34-9, Sulfur, uses 7723-14-0, Phosphorus, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses 7782-50-5, Chlorine, uses
RL: MOA (Modifier or additive use); USES (Uses)
(dopant; method for reversible **storage** of **hydrogen**
in solid-state materials)
IT 7439-93-2, Lithium, processes 7782-42-5, Graphite, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
IT **7580-67-8**, Lithium hydride
RL: MOA (Modifier or additive use); USES (Uses)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
IT **1333-74-0**, **Hydrogen**, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
IT 12013-82-0, Calcium **nitride** **12135-01-2D**, Lithium imide, Li-enriched 26134-62-3, Lithium **nitride** **39380-21-7**, Calcium hydride **nitride** Ca2HN 521075-62-7, Lithium nickel **nitride** (Li2.4Ni0.3N) **521075-63-8**, Lithium hydride **nitride** (Li2-3H0-1N) 521075-64-9, Lithium carbide **nitride**
RL: TEM (Technical or engineered material use); USES (Uses)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
IT 7440-44-0, Carbon, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(nanotubes; method for reversible **storage** of **hydrogen**
in solid-state materials)
IT **7580-67-8**, Lithium hydride
RL: MOA (Modifier or additive use); USES (Uses)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
RN 7580-67-8 HCAPLUS
CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

IT **1333-74-0**, **Hydrogen**, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(method for reversible **storage** of **hydrogen** in
solid-state materials)
RN 1333-74-0 HCAPLUS

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **12135-01-2D**, Lithium imide, Li-enriched **39380-21-7**, Calcium hydride **nitride** Ca2HN **521075-63-8**, Lithium hydride **nitride** (Li2-3H0-1N)
RL: TEM (Technical or engineered material use); USES (Uses) (method for reversible **storage** of **hydrogen** in solid-state materials)
RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 39380-21-7 HCAPLUS
CN Calcium hydride nitride (Ca2HN) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
H	1	12385-13-6
Ca	2	7440-70-2

RN 521075-63-8 HCAPLUS
CN Lithium hydride nitride (Li2-3H0-1N) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
H	0 - 1	12385-13-6
Li	2 - 3	7439-93-2

L58 ANSWER 31 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:883766 HCAPLUS
DN 138:290377
TI Interaction of hydrogen with metal **nitrides** and imides
AU Chen, Ping; Xiong, Zhitao; Luo, Jizhong; Lin, Jianyi; Tan, Kuang Lee
CS Physics Department, National University of Singapore, Milton Keynes, MK7 6AA, UK
SO Nature (London, United Kingdom) (2002), 420(6913), 302-304
CODEN: NATUAS; ISSN: 0028-0836
PB Nature Publishing Group
DT Journal
LA English
AB The pursuit of a clean and healthy environment has stimulated much effort in the development of technologies for the utilization of hydrogen-based energy. A critical issue is the need for practical systems for **hydrogen storage**, a problem that remains unresolved after several decades of exploration. In this context, the possibility of **storing hydrogen** in advanced carbon materials has generated considerable interest. But confirmation and a mechanistic understanding of the **hydrogen-storage** capabilities of

these materials still require much work. Our previously published work on hydrogen uptake by alkali-doped carbon nanotubes cannot be reproduced by others. It was realized by us and also demonstrated by Pinkerton et al. (2000) that most of the weight gain was due to moisture, which the alkali oxide picked up from the atmospheric Here we describe a different material system, lithium **nitride**, which shows potential as a **hydrogen storage** medium. Lithium **nitride** is usually employed as an electrode, or as a starting material for the synthesis of binary or ternary **nitrides.** Using a variety of techniques, we demonstrate that this compound can also reversibly take up large amts. of hydrogen. Although the temperature required to release the hydrogen at usable pressures is too high for practical application of the present material, we suggest that more investigations are needed, as the metal-N-H system could prove to be a promising route to reversible **hydrogen storage.**

CC 52-3 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **hydrogen storage** lithium **nitride**; calcium **nitride hydrogen storage**

IT Absorption
Desorption
(absorption-desorption isotherms; interaction of hydrogen with metal **nitrides** and imides for **hydrogen storage**)

IT **1333-74-0**, Hydrogen, processes 12049-66-0, Calcium **nitride** Ca2N 26134-62-3, Lithium **nitride** Li3N
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(interaction of hydrogen with metal **nitrides** and imides for **hydrogen storage**)

IT **7580-67-8**, Lithium hydride LiH **12135-01-2**, Lithium imide **12400-28-1**, Calcium imide
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)
(interaction product; interaction of hydrogen with metal **nitrides** and imides for **hydrogen storage**)

IT **1333-74-0**, Hydrogen, processes
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)
(interaction of hydrogen with metal **nitrides** and imides for **hydrogen storage**)

RN 1333-74-0 HCAPLUS

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7580-67-8**, Lithium hydride LiH **12135-01-2**, Lithium imide **12400-28-1**, Calcium imide
RL: CPS (Chemical process); FMU (Formation, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); FORM (Formation, nonpreparative); PROC (Process)
(interaction product; interaction of hydrogen with metal **nitrides** and imides for **hydrogen storage**)

RN 7580-67-8 HCAPLUS

CN Lithium hydride (LiH) (7CI, 8CI, 9CI) (CA INDEX NAME)

LiH

RN 12135-01-2 HCAPLUS
CN Lithium imide (Li2(NH)) (9CI) (CA INDEX NAME)

Li—NH—Li

RN 12400-28-1 HCAPLUS
CN Calcium imide (Ca(NH)) (7CI, 9CI) (CA INDEX NAME)

Ca═NH

RE.CNT 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 32 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:792110 HCAPLUS
DN 137:296983
TI Solid compositions comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion
IN Gauthier, Corinne; Perut, Christian; Roller, Denis
PA SNPE, Fr.
SO Eur. Pat. Appl., 9 pp.
CODEN: EPXXDW
DT Patent
LA French
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1249427	A1	20021016	EP 2002-290675	20020318
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	FR 2823203	A1	20021011	FR 2001-4839	20010410
	FR 2823203	B1	20040409		
	JP 2002338202	A2	20021127	JP 2002-105538	20020408
	US 2003051785	A1	20030320	US 2002-117915	20020408
PRAI	FR 2001-4839	A	20010410		

AB **Hydrogen** gas is **generated** from a mixture of sodium or lithium borohydride with ammonium nitrate; the mixture may be pelletized or granular. The nitrate may be replaced by a **dinitramide.**
IC ICM C01B003-06
ICS H01M008-00
CC 49-1 (Industrial Inorganic Chemicals)
ST **hydrogen generation** alkali metal borohydride ammonium salt
IT Nitrates, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid compns. comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion)
IT **1333-74-0P**, Hydrogen, preparation 16971-29-2DP, Tetrahydroborate, alkali metal salts
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(solid compns. comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion)
IT 6484-52-2, Ammonium nitrate, reactions **16940-66-2**, Sodium borohydride **16949-15-8**, Lithium borohydride
RL: RCT (Reactant); RACT (Reactant or reagent)

(solid compns. comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion)

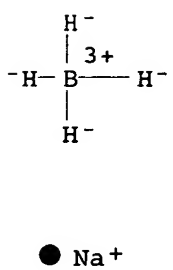
IT **1333-74-0P**, Hydrogen, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(solid compns. comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion)

RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

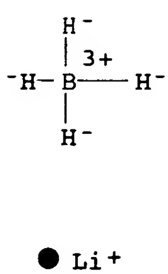
H—H

IT **16940-66-2**, Sodium borohydride **16949-15-8**, Lithium borohydride
RL: RCT (Reactant); RACT (Reactant or reagent)
(solid compns. comprising an alkali metal borohydride and an ammonium salt, which **generate hydrogen** gas upon combustion)

RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



RN 16949-15-8 HCAPLUS
CN Borate(1-), tetrahydro-, lithium (8CI, 9CI) (CA INDEX NAME)



RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L58 ANSWER 33 OF 33 HCAPLUS COPYRIGHT 2006 ACS on STN
AN 2002:343444 HCAPLUS
DN 136:357114
TI **Hydrogen-generating** system, and separation of metal hydrogen complexes from their oxidized forms
IN Nakamura, Masanori; Nakao, Osamu; Tsuchiyama, Kazuo; Suda, Seijiro
PA Sekisui Chemical Co. Ltd., Japan; Hydrogen Energy Kenkyusho K. K.

SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

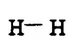
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002126458	A2	20020508	JP 2000-330317	20001030
PRAI	JP 2000-330317		20001030		

OS MARPAT 136:357114

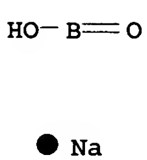
AB In **generation** of **hydrogen**, a metal **hydrogen** complex compound dissolved in an aqueous alkaline solution is decomposed to its oxidized form and hydrogen in the presence of a catalytic metal, a hydrogen-absorbing alloy, or their fluorinated forms at room temperature; wherein unreacted metal hydrogen complex in the alkaline solution is selectively separated from its oxidized form to promote the decomposition process by using a microporous membrane having sodium chloride-permeation-inhibition rate ≥70%. The metal hydrogen complex compound has a general formula MIMIIIH4-nRn or MII(MIIIH4-nRn)2 (MI = alkali metal; MII = alkaline earth metal, Zn; MIII = B, Al, Ga; R = alkyl, alkoxy, acyloxy; n = 0-3). The separation method is handy, safety, and environmental benign.

IC ICM B01D061-14
ICS C01B003-04; C07B061-00; H01M008-04; H01M008-06
CC 49-1 (Industrial Inorganic Chemicals)
ST hydrogen manuf metal hydrogen complex decompn; microporous membrane sepn metal hydrogen complex; reverse osmosis sepn metal hydrogen complex
IT Fluoropolymers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(microporous membrane layer; manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT **Polyamides**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(microporous membrane; manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT Membranes, nonbiological
(microporous, separation; manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT Polysulfones, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polyether-, microporous membrane layer; manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT Polyethers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(polysulfone-, microporous membrane layer; manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT Reverse osmosis
(separation; manufacture of hydrogen by decomposition of metal hydrogen complex to its

oxidized form and hydrogen, and selectively separation of unreacted complex)
IT **1333-74-0P**, Hydrogen, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT **7775-19-1P**, Sodium borate (NaBO2)
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PYP (Physical process); PREP (Preparation); PROC (Process)
(manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT 24937-79-9, Vinylidene fluoride polymer
RL: TEM (Technical or engineered material use); USES (Uses)
(microporous membrane layer; manufacture of hydrogen by decomposition of metal
hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT 340017-44-9, Nanomax 95 422274-57-5, ACSA 0037
RL: TEM (Technical or engineered material use); USES (Uses)
(microporous membrane; manufacture of hydrogen by decomposition of metal hydrogen
complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT **16940-66-2**, Sodium borohydride (NaBH4)
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(separation of; manufacture of hydrogen by decomposition of metal hydrogen complex to
its oxidized form and hydrogen, and selectively separation of unreacted complex)
IT **1333-74-0P**, Hydrogen, preparation
RL: IMF (Industrial manufacture); **PREP (Preparation)**
(manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
RN 1333-74-0 HCAPLUS
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

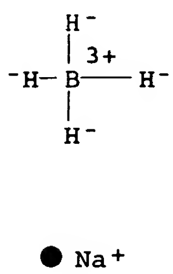


IT **7775-19-1P**, Sodium borate (NaBO2)
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PYP (Physical process); PREP (Preparation); PROC (Process)
(manufacture of hydrogen by decomposition of metal hydrogen complex to its oxidized form and hydrogen, and selectively separation of unreacted complex)
RN 7775-19-1 HCAPLUS
CN Boric acid (HBO2), sodium salt (8CI, 9CI) (CA INDEX NAME)



IT **16940-66-2**, Sodium borohydride (NaBH4)
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(separation of; manufacture of hydrogen by decomposition of metal hydrogen complex to

its oxidized form and hydrogen, and selectively separation of unreacted complex)
RN 16940-66-2 HCAPLUS
CN Borate(1-), tetrahydro-, sodium (8CI, 9CI) (CA INDEX NAME)



=>